FLIGHT
and
AIRCRAFT ENGINEER

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The Outlook

Backing for the Clubs

IT is very gratifying to observe the increased interest which is being taken in light aircraft and the flying clubs. For some week-ends past, several successful flying meetings and displays have been organized, and the International Rally at Derby, in spite of one or two slight setbacks, was very well attended. We now look forward to the R.A.F.-supported and Air League-organized Blackpool Air Pageant, which is to last for three weeks. There has been a great deal of pessimistic talk about the high cost of flying and the probable extinction of the private owner, but such is our belief in the spirit and enthusiasm of the active nucleus of old-timers and their younger disciples that we do not admit such a possibility, come what may. The same is true of their non-powered brothers on the wing.

Of course, the cost of flying at the present time is prohibitive for the majority of air-minded people, and, what is more serious to the private flying movement, the clubs are undoubtedly having a very lean time financially, even with flying rates of £3 10s per hour. There is a limit to how long other club activities, associated concerns, wartime compensation and the like can subsidize the flying side. As has already been suggested, a cost of £1 per hour is a reasonable figure at which to aim.

There is little need to stress the value to the country of a keen and active reserve of private pilots. To anyone who is unfamiliar with the excellent—almost vital—work of club pilots recruited into the A.T.C. and of the 740 private pilots who enlisted in, and more than solved a major problem for, the Fleet Air Arm early in the war, the details would be illuminating. It might be said that the country "owes" the private flying world at least £2,000,000, the sum estimated to have been saved on the training of the Naval pilots alone.

It is to be hoped that Lord Nathan's active week-end at Derby and Bramcote, when he talked and flew with the people who will depend on his support in the future if their flying clubs are to prosper and expand, will have convinced him of the vitality of the private flying and light aircraft world. Further, when the recommendations of Mr. Whitney Straight's committee are placed before him we hope that he will not hesitate to recommend that they be implemented to the fullest and most generous extent. It then remains for approval to be given to the recommendations forwarded by Mr. Peter Masefield and his Informal Light Aircraft Committee. These are intended to ensure that both power flying and gliding clubs shall have thoroughly safe, suitable and economical replacement aircraft available for their early use. By achieving a certain standardization, economy of production should be realized and there will be the added advantage of providing good competitive British machines for the export market.

A Ministerial Taxi

SIR HENRY SELF gave the assurance a few weeks ago that the Ministry of Civil Aviation has great faith in the future of the helicopter and, more particularly, that it intends to give full support to the Westland company in the matter of the Sikorsky 51 design which they are building under licence. It has been announced already that the Government is to buy three of these machines.

Last week the Parliamentary Secretary to the Ministry, with the intention of recording his impressions, tried out a Westland Sikorsky as a taxi from his home in Welwyn Garden City, to St. James's Park. The importance of this flight in the eyes of the Ministry may, perhaps, be judged by the fact that *Flight* received no fewer than five separate written warnings of Mr Lindgren's intentions, together with invitations to witness his arrival.

Whenever Mr. Lindgren or his colleagues decide personally to experience the practical side of flying, we welcome the fact, but since the precision with which a

helicopter can be flown has already been ably demonstrated at various displays given by the Services, and more recently by the Westland pilots at Barnes, a mere arrival in a roped-off enclosure in St. James's Park does not appear to add very much to the existing knowledge. We want to see Mr. Lindgren make a regular practice of flying from his back garden and landing on his office roof, and if at any time he should decide to pay us a call and land on the roof of *Flight's* offices to give us his impressions first-hand we shall be glad to record them in our pages. Present regulations could possibly be stretched a point for the benefit of the Parliamentary Secretary.

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"Chosen Instruments"

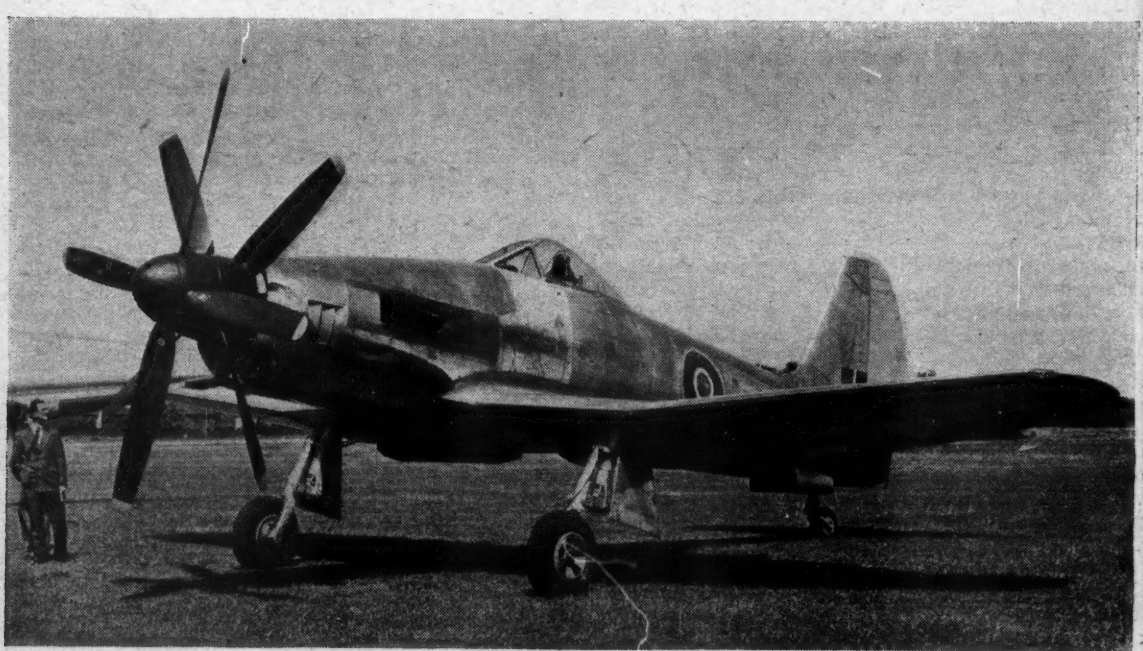
AVIATION interests on this side of the Atlantic have been watching with close attention the endeavours being made by certain advocates to get American international air lines merged into a single unified concern. Chief protagonist is Mr. Juan Trippe, Pan American's energetic president, whose basic argument, if we understand him correctly, is that under the present system America's international air lines are competing against each other instead of presenting a united front against foreign organizations.

Well-informed American circles do not appear to regard Mr. Trippe's chances of success as being very good, but this fact did not prevent the chairman of the Civil Aeronautics Board, Mr. James M. Landis, from bringing up in opposition to the unification scheme all the big guns that seemed likely to aid his case. Mr. Landis, as we recorded last week, was testifying before the Senate Interstate and Foreign Commerce Aviation Subcommittee, and by way of defeating Mr. Trippe's arguments he drew the blackest possible picture of the state of British commercial aviation and its future prospects.

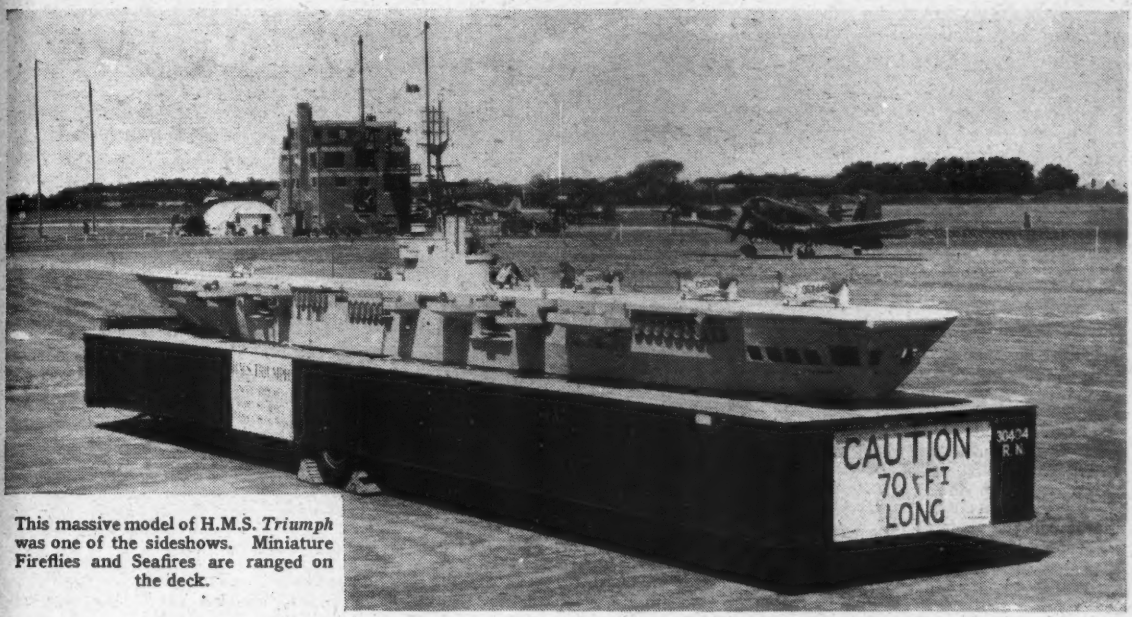
America's aviation policy is, of course, entirely her own affair, and it would be an impertinence on our part to presume to offer advice. But we may properly question the ethics of this case. Mr. Landis was quoting from sources which must have been confidential reports by State Department employees, a procedure which would certainly not be sanctioned in this country, and which we do not believe to be common practice on the other side of the Atlantic.

Mr. Landis gave anti-British sections in America a fine opportunity, and it is scarcely surprising that *Aviation News* of New York should have made the most of it. That journal, in its issue of June 16th, devotes nearly two pages to telling its readers that Britain and Russia are in no possible state to be a threat to American supremacy in world commercial aviation. Reasons are quoted for the delays which have occurred in connection with our newer aircraft types, and troubles (some real, some not so real) are listed with ill-concealed glee.

Just what good this sort of sniping can possibly do anyone is difficult to see. The two English-speaking nations are closely bound together by common aims and interests. Those interests are not furthered by such sneering appraisals,



UP FROM SOMERSET: The Rolls-Royce Eagle-engined Westland Wyvern which made its first public appearance at the Command Air Display at Lee-on-Solent. Further photographs and a description appear on page 5.



This massive model of H.M.S. *Triumph* was one of the sideshows. Miniature Fireflies and Seafires are ranged on the deck.

NAVAL OCCASION

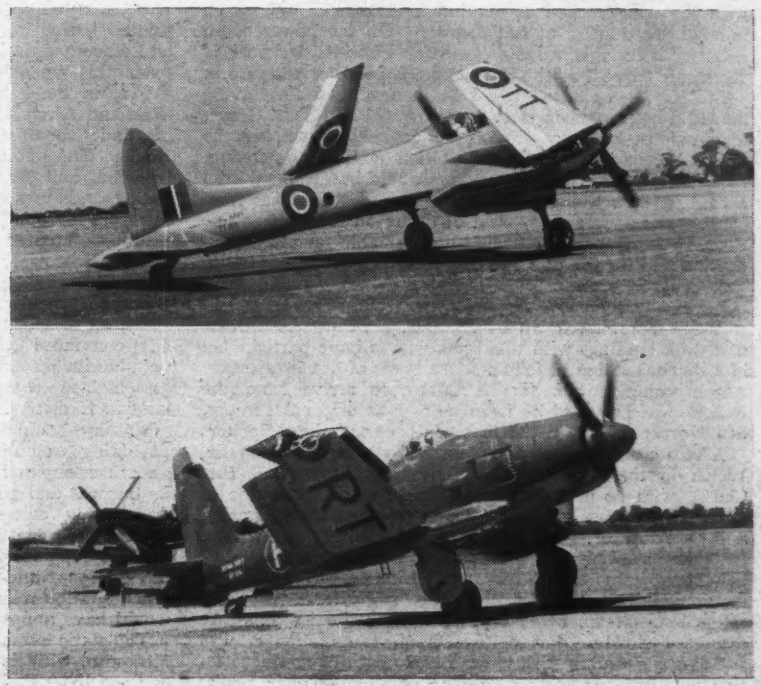
Impressive Display by New Aircraft at Lee-on-Solent

Illustrated by "Flight" Photographs

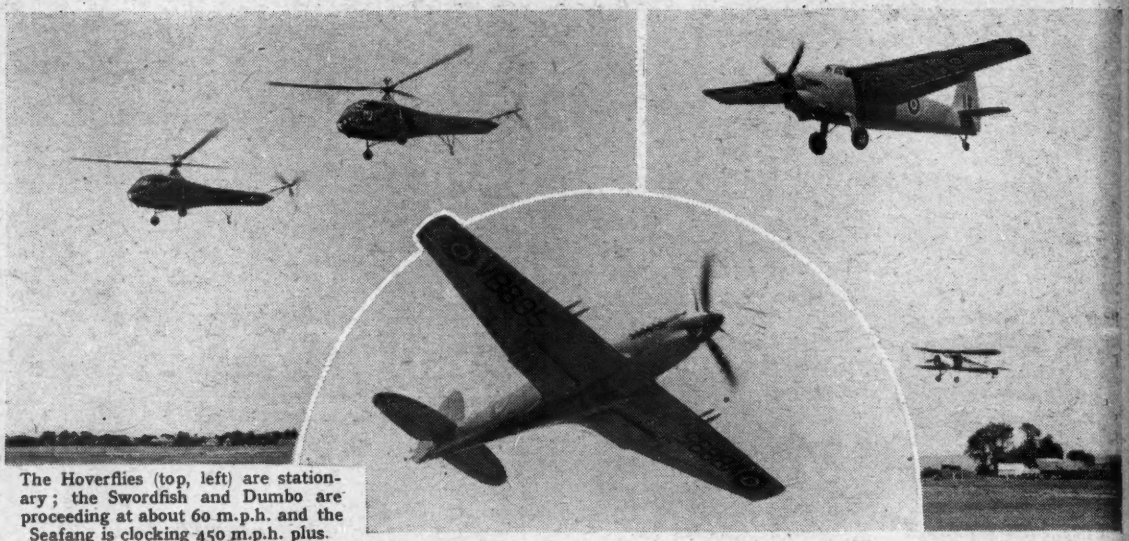
AS the guests of Vice-Admiral Sir Thomas Troubridge, Flag Officer (Air) (Home), at Lee-on-Solent on Wednesday of last week, a distinguished company of visitors witnessed, in the Air Command Display, a first-rate demonstration by recent types of Naval and other aircraft. Vice-Admiral Sir Philip L. Vian, Fifth Sea Lord, and Rear Admiral M. S. Slattery, Vice Controller (Air), came down from the Admiralty, and R.A.F. officers included A.V-M. C. B. S. Spackman, commanding 19 Group at Plymouth, A.Cdr. G. D. Harvey (West Raynham), A.Cdre. C. B. R. Pelly (Boscombe Down), and A.Cdre. Vernon Brown, Chief Inspector of Accidents. The Army, foreign Air Attachés, and the industry were strongly represented, and everyone—by no means least the demonstration pilots—appeared to be having a thoroughly enjoyable day. A hot sun beamed on the Solent, there was abundant good company, a variety of aircraft reminiscent of Radlett, and that unostentatious efficiency which is so characteristically Naval. A fatal accident cast the only shadow.

The appetites of our readers having been whetted by references in earlier issues to the Eagle-engined Westland Wyvern T.F.1, it is satisfying to be able to present in this issue the first photographs of this impressive new strike fighter, which made its first appearance.

To the Chipmunk, Auster, Gemini, Dove and Concordia fell the honour of opening the flying programme. Mr. Hythe, in the Chipmunk, specialized in tight loops and hesitation rolls; the Auster, Gemini and Dove (Capt. Byas, S/L. Nelson and Mr. Fossett) expressed their individuality; and the Concordia, less familiar, but evidently quite at home in public, illustrated the latest



Two studies in wing-folding at Lee-on-Solent: Top, the D.H. Sea Hornet XX; below, the Blackburn S.28/43, or Firecrest. Note the Sea Hornet's dorsal fin



The Hoverflies (top, left) are stationary; the Swordfish and Dumbo are proceeding at about 60 m.p.h. and the Seafang is clocking 450 m.p.h. plus.

fashion in feeder liners. It performs as well as it looks, and Mr. Corbin had no hesitation in flying on one engine.

It is always a treat to see a Seafang perform. S/L. Derry, in a Mark 32, was not content with the more conventional aerobatics: he showed how this 475-m.p.h. fighter behaves in inverted climbs and high-speed aileron turns, and rounded off his outstanding show with a bunt—a manœuvre rarely performed deliberately these days in a high-speed fighter. Another unfamiliar Supermarine type—the Type 322 or Dumbo—teamed up with a Swordfish for the following event, intended to illustrate slow flying and high lift. Lt. Cdr. Summerfield, in the Stringbag, went further; he showed the amazing handling qualities of this veteran torpedo carrier in low-level manœuvres. A steep dive and low pull-out after a stall turn at a few hundred feet was alarming. Dumbo came by at 60 m.p.h. or so with the wing cocked at maximum incidence, and again, in high speed trim, at full throttle. On the power of an elderly Merlin this valuable research aircraft, designed to the same "spec" as the Barracuda, is good for 280 m.p.h.

Lt. K. M. Reid (who will be remembered for having landed a helicopter on H.M.S. *Vanguard*) and S/L. Green, in a pair of Sikorsky Hoverflies, gave what can best be described as a very polished exhibition of ballroom dancing, though certain of their manœuvres would hardly have been permitted in a well-conducted dance hall. The Navy, of course, has done a great deal of flying on this type. The Fleet Requirements Unit finds it invaluable for radar calibration and for the photographic recording of torpedo trials.

Seafire, Sea Hornet, Attacker

A Sea Vampire, flown by Lt. Cdr. Brown, who did the first deck landings with this type, was to have participated in a demonstration of four modern types of fighter aircraft. Ample compensation for its failure to arrive from the R.A.E. was provided by its co-demonstrators, a Seafire 47, Sea Hornet XX, and the first prototype of the Attacker.

A recalcitrant wheel flap appeared not to handicap Lt. Welch in the Seafire. The silver Sea Hornet XX (Lt. Clark), with its new dorsal fin, looked as smart as one of D.H.'s scale models (though it was always far from static), and the Attacker, flown, appropriately enough, by Lt. Cdr. Lithgow, showed how this potential record breaker has benefited from the fitting of spring tabs. Often its manœuvres were traced by contrails, and after a very slow roll a long stream of smoke issued from the jet pipe and dispersed slowly. Mr. Jeffery Quill, for a change, was wielding a shooting stick instead of a control column. The first navalized Attacker is already undergoing flight trials.

After these flashing performances, Lt. Bullivant, in the Fairey Operational Trainer, had his work cut out to hold interest, but this he successfully accomplished by gathering plenty of speed in dives, coming very low past the enclosure, and upward-rolling away.

Three single-seat strike aircraft—the Firebrand V, Blackburn S.28/43, or Firecrest, as its pilot called it, and the Wyvern, had an event to themselves. The Firebrand, flown by Lt. Flygenring and carrying a practice torpedo fitted with an air tail, was first away. Coming in extremely low, it narrowly missed a parked Firefly IV and pulled up over a hangar for a roll from which it never recovered. The crash, though near, was inaudible, and the show went on.

New Strike Aircraft

G/C. C. Flood gave the first public performance on the Centaurus-powered Blackburn S.28/43. The Navy was particularly interested in his demonstration of "double-jointed" wing-folding, very quick undercarriage retraction and smooth flying. Blackburns should learn a great deal from this imaginative design. The Westland Wyvern T.F.1, in the hands of Mr. Penrose, chief test pilot to Westland Aircraft, Ltd., climbed away steeply from take-off, under the urge of its 3,500 h.p. 24-cylinder sleeve-valve Eagle. The published speed of 455 m.p.h. could well be believed, and Mr. Penrose executed rolls and other aerobatic manœuvres with great finesse. With contrails streaming from its rounded wing tips, this 22,000 lb strike fighter prototype created a very favourable impression.

Mr. Bristowe, whose beautifully finished Westland-Sikorsky S.51 helicopter made the Naval Hoverfly Is look somewhat shabby, lowered a passenger with great precision on to a hangar gallery, and the Short Sturgeon (Lt. Orr) convinced everyone of its unusual speed range. This twin-Merlin reconnaissance aircraft is now being developed as a high-speed target towet, and has just completed deck-landing trials on H.M.S. *Illustrious*.

Nothing could have been better, by way of a finale to the flying programme, than a display of aerobatics by the Centaurus-engined Sea Fury X, which is unexcelled for its purpose and is now coming into service. Lt. J. Elliott was highly complimented for his masterly flying. He showed the remarkable qualities of lateral control possessed by this compact Hawker fighter-bomber, with its spring-tab ailerons, and flew inverted for considerable periods. His hesitation rolls were geomtrically perfect. Bill Humble would have approved.

The static exhibition, in a blitzed hangar, featured a Sea Mosquito, with its full armament load displayed (including a 2,000 lb A.P. bomb with a 166 lb Shellite filling, and having a T.V. of 2,820 ft/sec), a sectioned Firebrand, engines, A.S.R. gear and an accident prevention stand.

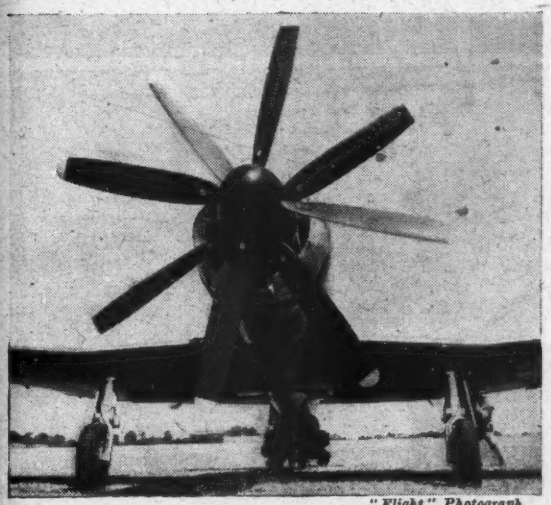
WESTLAND WYVERN

Naval Strike Fighter with Rolls-Royce Eagle Engine: Performance and Weight Figures

DESIGNED by Westland Aircraft, Ltd. specifically as a deck-landing Naval strike fighter, the Wyvern T.F.1 is an all-metal single-seater, powered by a Rolls-Royce Eagle 24-cylinder, flat-H, sleeve-valve engine of 3,500 h.p. Preliminary technical data were released at the Command Air Display at Lee-on-Solent last week and are reproduced on this page. It was further announced that the Wyvern 1 is being used for development pending the production of later marks. Design features worthy of special study are the power plant installation, flaps, wide undercarriage and good field of view from the neatly enclosed pilot's cockpit.

The Eagle drives an eight-blade contra-rotating Rotol airscrew, and is cooled by radiators under the centre-section of the mainplane. Beneath the airscrew shaft appears to be a segmental oil cooler, the air being taken in below the spinner and exhausted through louvres round the bottom of the cowling. The exhaust ports are very deeply recessed, and the power plant installation is further notable for the very sharp fall-away of the top cowling line forward of the pilot's windscreen, even with the aircraft in tail-down position. This feature, of course, is allowed by the remarkably shallow depth of the Eagle and is equally desirable for deck landing, torpedo aiming and dive bombing.

Readers may care to be reminded that the Eagle was described in *Flight* of April 24th this year.



"Flight" Photograph.

The imposing frontal aspect of the Wyvern, displaying the eight-blade Rotol contra-rotating airscrew and the oil cooler behind and below the spinner.

Flap Design

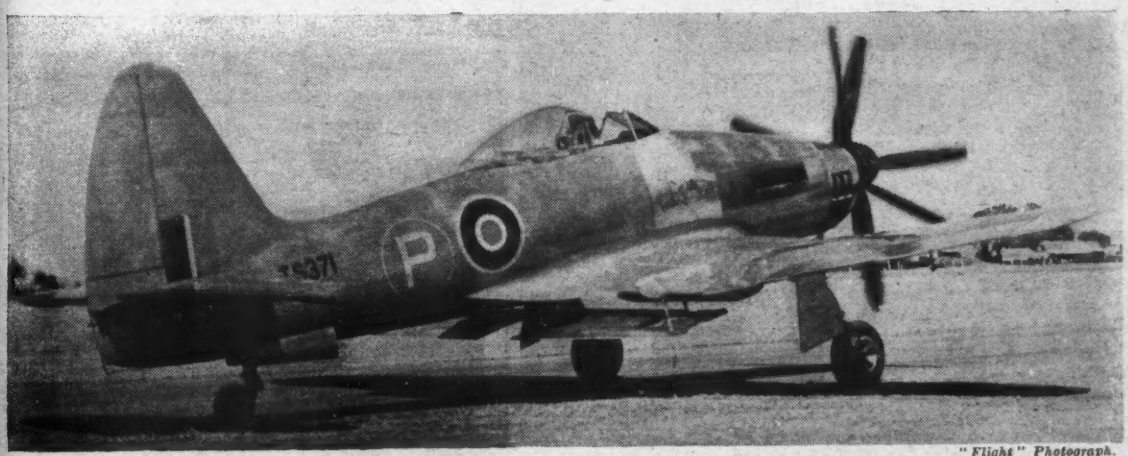
It is evident in one of the photographs on this page that the Wyvern's flaps are of unusual design, and that when in operating position they are carried well below the mainplane. Part of the flap mechanism is housed in fairings over the trailing-edge of the wing.

Of relatively thin section, the wing is cranked at a point slightly outboard of the undercarriage attachments. It has a moderate taper to rounded tips, inset from which are ailerons of unusually deep chord. All controls are aerodynamically balanced and Mr. Penrose's demonstration suggested that lateral control is unusually good.

To reduce drag on take-off the wells for the main wheels are faired over when the wheels are down. The tailwheel is fully retractable, but stowage of the arrester hook was not apparent on the prototype aircraft which appeared at Lee-on-Solent. Possibly the hook has temporarily been dispensed with for preliminary tests in order to accommodate a tail parachute. In general, the Wyvern is considerably cleaner than any other machine of its class.

DATA

Official designation	Wyvern T.F. Mk.I
Armament	4 × 20 mm guns
Bomb load	2,000 lb
Torpedo load	1 × 20in
R.P. load	8 × 60 lb
Fuel load	450 gall
Unladen weight	16,000 lb
Loaded weight	22,000 lb
Maximum speed	455 m.p.h.
Cruising speed	295 m.p.h.
Endurance	3¼ hrs



"Flight" Photograph.

This three-quarter rear view shows the Wyvern's clean fuselage lines, with a steep fall-away forward of the cockpit, the wide undercarriage and the disposition of the flaps.

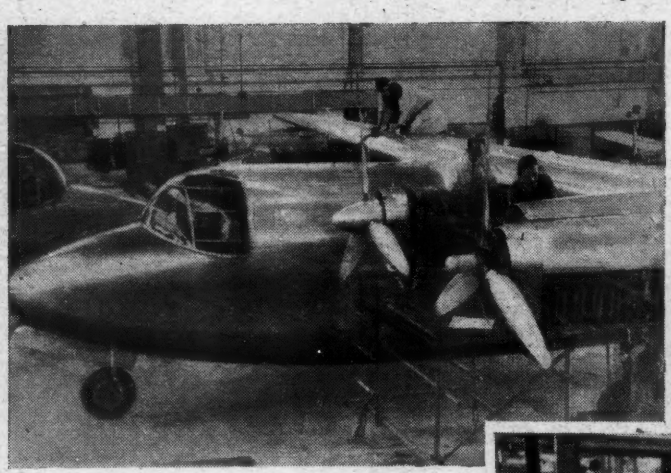
ROUND THE MILES WORKS

A Camera Tour Through the Erecting Shops at Woodley : Civil Aircraft in Quantity Production

Flight Photographs.

(Left) Working on the second prototype Marathon. This has twin fins instead of the triple fins fitted to the first prototype.

(Below) A finished Gemini is towed off to have its compass swung.

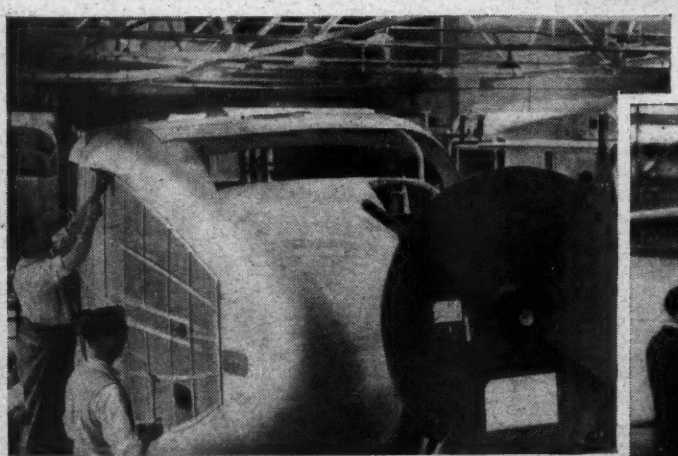


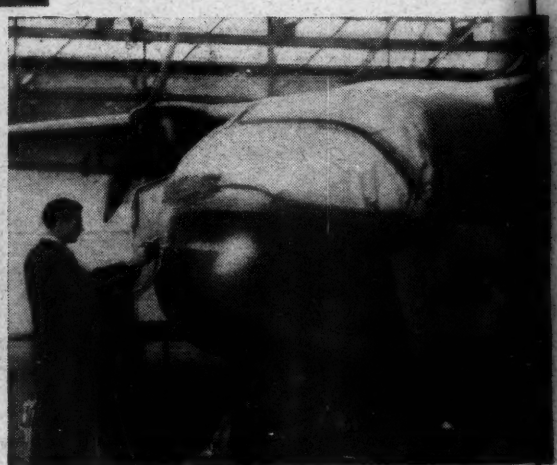
A VISIT to Miles Aircraft, Ltd., is always interesting if only to watch the skilled fabrication of both wooden and metal aircraft. In addition, there is a never-ending variety of new types and projects to be shown to the privileged visitor—these, for various reasons, are not yet available for publication.

No one could go through the Miles shops without noticing the air of industry with which the employees tackle their various jobs. This is a refreshing sight in these days and, since a large proportion of the firm's output is being sold abroad, it must reflect very favourably on the balance of exports against imports.

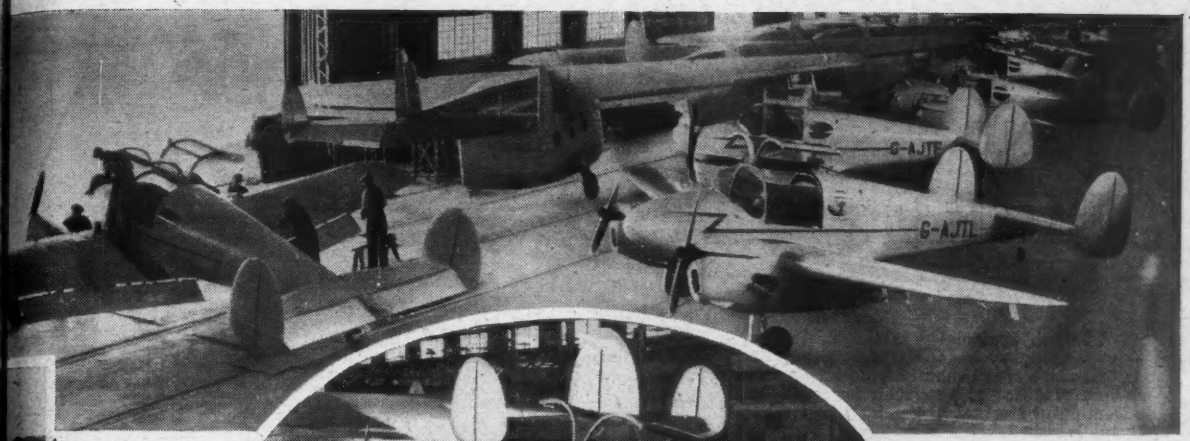
This enthusiasm is not confined to work only. On June 18th the Social Committee broadcast their fourth "Works Wonders" programme over the B.B.C. Only one other company in the Kingdom has exceeded this number.

A peep into the future. The third prototype Marathon which is being built to take Armstrong-Siddeley Mamba airscrew gas turbines.

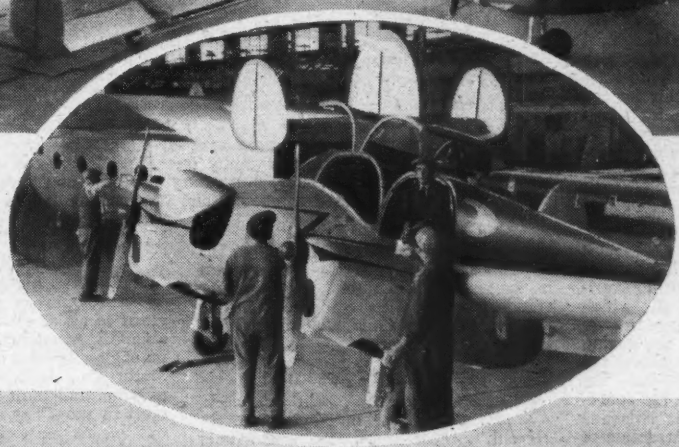




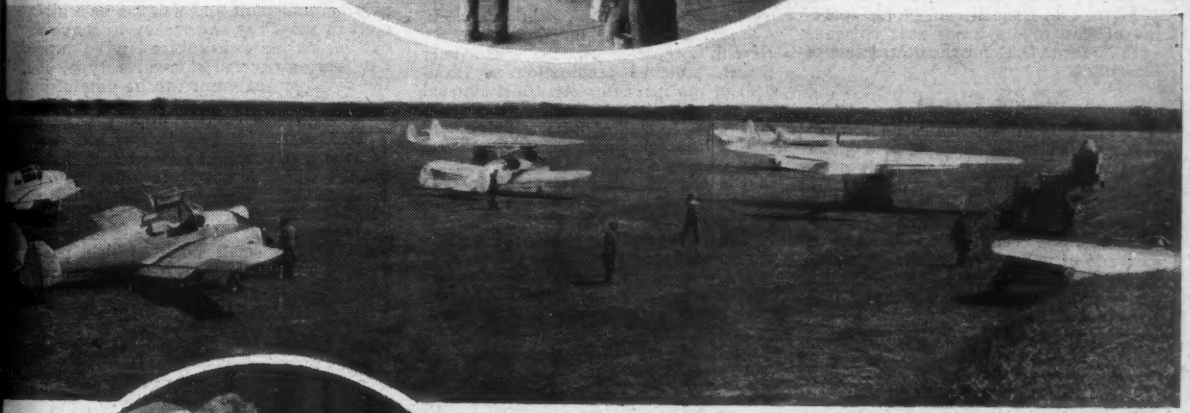
(Above) For ease of working, the roomy Aerovan fuselages are built on rotatable jigs. (Right) In the paint shop a blue Aerovan, G-AJTK for British Nederlands Airways, gets its final coat.



(Above) Production lines. Rows of Aerovans and Geminis in their final stages before delivery to customers. This photograph shows only one half of the final erection shop.

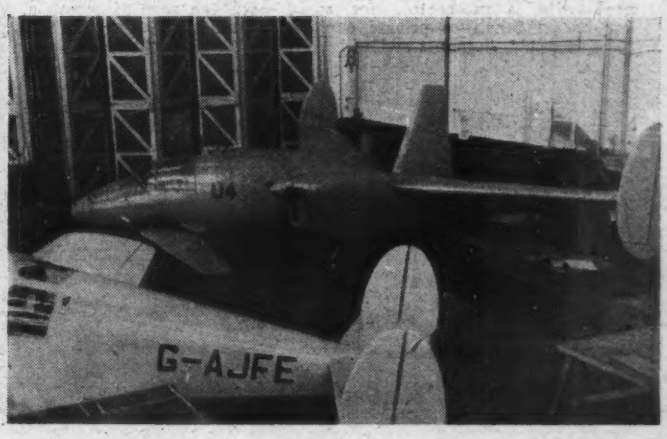


(Right) Finishing touch. A Gemini undergoing final polishing before making its debut on the tarmac. Paintwork is quite up to car standard.



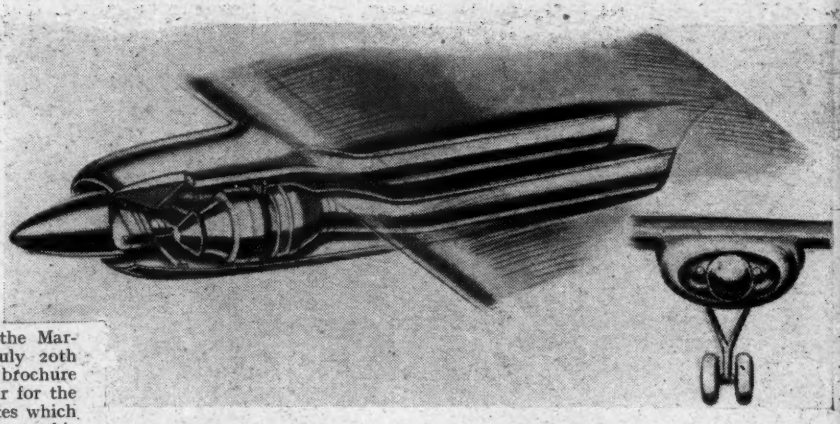
Aerovans and Geminis awaiting test flying and delivery at Woodley. All the production Geminis now have a fixed leading-edge slot between the engine and fuselage on each side. No Messengers appear in these photographs as they are all made at Newtownards, Northern Ireland.

(Above) The plywood nosepiece over the leading edge of an Aerovan wing is held by straps until the glue sets.



(Right) In a corner the yellow Libellula (Miles 35) rests until it is wanted for further experimental flying.

HERE AND THERE



DOUBLING UP: One of the features of the Rolls-Royce exhibit in the static display at the Derby Airport recently (see *Flight* last week) was a model, shown ghosted and sectioned above, illustrating the suggested layout of a pair of airscrew turbines, geared to coaxial airscrews and built into a single nacelle.

Looking Back

THE fiftieth anniversary of the Marconi Company falls on July 20th this year and a commemoration brochure has been produced as a souvenir for the Convention of Marconi Associates which is being held in London to celebrate this event. The brochure, lavishly illustrated with photographs, tells the story of the developments of the Marconi Company from 1897 to the present day.

Wild Oats

IN Australia, the Civil Aviation department has granted a licence to Agricultural Aviation Services, Ltd., which will allow the company to engage in crop dusting, land fertilization and the sowing of seed from the air. First job of the company, under a contract with the Brisbane City Council, will be the spraying of Mangrove swamps near Brisbane with liquid D.D.T. for the destruction of mosquitos.

Quiet Please

LATEST from America is an aircraft reported to be as quiet as a glider even when flying as low as 300ft overhead. It has been developed and demonstrated at Langley airfield by the National Advisory Committee for Aeronautics, and embodies all known methods of noise suppression. A major feature of the machine is its five-bladed airscrew, which rotates at a slower rate than the orthodox two or three-bladed airscrew and so, it is claimed, reduces noise to a minimum.

Aerial Prospecting

HELICOPTERS again came into the news last week when it was announced from Toronto that Hans Lundberg, a pilot-geologist, is exploring the forests of Northern Ontario in a helicopter fitted with metal divining equipment. He is prospecting for metal deposits on behalf of private exploration and mining interests and will cover 125,000 square miles of territory in the Hudson Bay area. If this present test is successful helicopters may become standard exploration equipment in the development of Canada's mineral resources.

Navigation Research

AT the first meeting, held last week, of the Institute of Navigation, Sir Harold Spencer Jones, the Astronomer Royal, accepted nomination as President of the Institute. Air Chief Marshal Sir John Slessor presided at the meeting, when pressure pattern flying and related techniques were discussed. Papers were read by F/L. L. F. Banks, D.F.C., of the Empire Air Navigation School; Mr. J. S. Sawer, M.A., of the Air Ministry Met. Office; Mr. E. W. Pike, of B.O.A.C.; and S/L. Fraser, of the Institute of Navigation.

The aim of the Institute is to stimulate and co-ordinate research and development work in navigational problems.

Well Tied

A SINGLE-ENGINED 65 h.p. aircraft bought at an American Army surplus disposal sale for £75 was flown 2,300 miles from Berlin to Shannon, Ireland, via Brussels, Croydon and Belfast, in 20 hours' flying time. The pilot, an American ex-air force mechanic, stated that he was forced down in the Russian zone of Germany, but took off again after tying up the petrol filter with his necktie!

40 h.p. Conversion

THE Ultra Light Aircraft Association are hoping to obtain a development grant to assist them in obtaining a suitable U.L.A. engine. Mr. W. A. Weaver, managing director of the Coventry Victor Motor Co., Ltd., who is a pioneer in aviation and built and flew his own aircraft in 1905, has undertaken to convert one of his existing engines, a 40 h.p. flat four, air-cooled side-valve type, if the development grant can be obtained.

B.O.A.C. Booklet

FULL marks must go to B.O.A.C. for the production of an excellent little booklet which is now being distributed to those of its staff whose job it is to handle passengers. Entitled "Selling Seats by Service," it is designed to stress some of the small points which passengers appreciate and remember, and it succeeds very well. The illustrations by Raff (who created that animated character P/O. Prune), besides being witty, add a great deal of punch to the general message.

Extending Service

UNDER a new scheme introduced by B.O.A.C. in co-operation with other transatlantic operators, passengers over the Atlantic route may now choose the airport from which they wish to begin their return flight. Previously an air traveller whose business, for instance, took him from London to New York and back to Britain from Montreal, had to

TEST FLIGHT: The Martin XB-48, photographed on its first take-off. This view clearly shows the unorthodox tandem-type undercarriage which retracts into the fuselage and the two outboard steadying wheels. The grouping of the six jet engines and the full-span flaps are also interesting features to note.

HERE AND THERE

pay full fare for each Atlantic crossing. Under the new system return fares are payable for such journeys. Similar arrangements are available to Canadians or Americans visiting Europe, and for some journeys from Britain to the Middle East and East Africa. Such "elasticity" of bookings is a welcome sign, and it is hoped that still further advantages may be provided through the co-operation of the world's airlines.

2,100 m.p.h.?

THE U.S. Army Air Force has given a contract to the Douglas Aircraft Co. for the design of an aircraft capable of flying at 2,100 m.p.h. and attaining heights of 200,000 to 300,000ft (about 37-56 miles). This aircraft is the third of a series of machines designed for speeds faster than sound; the first, the XS-1, has made twenty test flights but has never reached the speed of sound; the second, the XS-2, is still being built. The new aircraft will be called the XS-3, and it is understood that the Douglas Company has made sixty different design studies, ranging from a stubby, blunt-nosed model to one with a long slender fuselage with a sharp bullet-like point at front and rear. Several power units are under consideration and it is possible that turbo-jets and rocket power will be used, both singly and in combination.

In Miniature

THE twenty-second "Model Engineer" Exhibition will be opened on August 20th for ten days at the New Royal Horticultural Hall, Vincent Square, Westminster, S.W.1. A special feature of this year's show, which should interest model aircraft builders, will be an arena for working models in which there will be frequent demonstrations of model aircraft in actual flight.

ELDER SISTER: Pictured leading a Gemini in formation is the Miles Martlet—the first aircraft in the long line of Miles productions. The Martlet was built in 1929/30 at Shoreham Airport. One of these machines has recently been purchased by Butlin's Holiday Camps for aerobatic displays.

A.O.A. Freight Service

A NEW all-cargo service was due to start from New York last Thursday and fly via Newfoundland, Ireland, England and Holland to Germany. Inaugurated by A.O.A., the new schedule will operate one round trip a week, westbound flights leaving Frankfurt, Germany, for New York every Friday. This service is claimed to be the only scheduled all-cargo run into Germany serving the occupation forces.

Up to Date

THE Air Arm of the Royal Netherlands Navy is now being equipped with the latest version of the Fairey Firefly reconnaissance fighter, the Mk. IV. The first deliveries of a considerable number of Mk. IV Fireflies have been made to Holland, where the type will replace the Mk. I, now in full naval service in squadrons located in the Netherlands and in the Dutch East Indies

FAST COMPANY: Seen with the Attacker jet fighter are Vickers-Supermarine test pilots; from left to right, F/L. L. R. Colquhoun, Lt. Cdr. M. J. Lithgow, Mr. Jeffery Quill, Mr. W. J. G. Morgan and S/L. J. D. Derry. The Attacker may be used next year for an assault on the air speed record. As related on page 4 it was demonstrated at Lee-on-Solent recently by Lt. Cdr. Lithgow.

News in Brief

Mr. A. K. Dewdney, of Newhaven, Sussex, has been appointed B.O.A.C.'s Station superintendent at Shannon Airport, Eire. Mr. Dewdney joined Imperial Airways in 1938 and served with B.O.A.C. in Bermuda from 1943 to 1945.

* * *

The first of three Dakotas have been delivered to the Yugoslav Airlines, after being converted by the Fokker works at Amsterdam. All three Dakotas are fitted with Rumbold equipment.

* * *

Mr. Freeman Horn, on reaching retiring age, is relinquishing his position as Intelligence Officer and Manager of the special products department of the British Aluminium Co., Ltd.

* * *

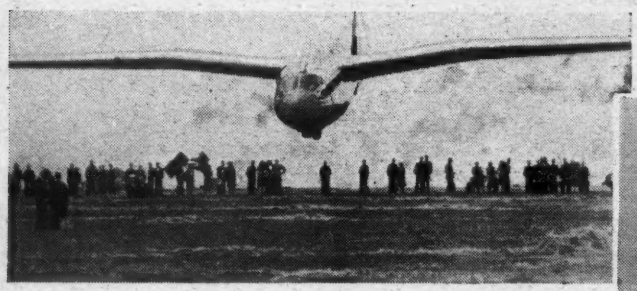
Lt. Col. L. W. Charley, formerly foreign representative first of the Gloster Aircraft Co., Ltd., and later of the Palmer Tyre Co., Ltd., has now taken up an important post with Dashwood & Partners, Ltd., Merchant Shippers, Importers and Exporters. Lt. Col. Charley will be particularly concerned with European markets, of which he has an intimate knowledge.

* * *

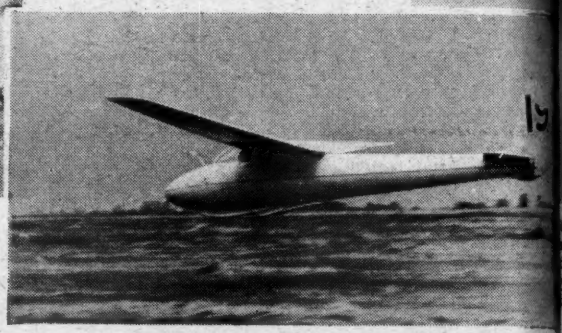
The ABC international air and shipping guide No. 158, June to July, 1947, is now in circulation. It is published by Thomas Skinner and Co., Ltd., 141, Fetter Lane, London.

NATIONAL GLIDING CONTESTS

Over 2,000 Miles Flown in One Day : Two-seater Reaches 2,700ft : Variable Weather Conditions



A non-competitor, the Gull II comes in to land over the spectators.

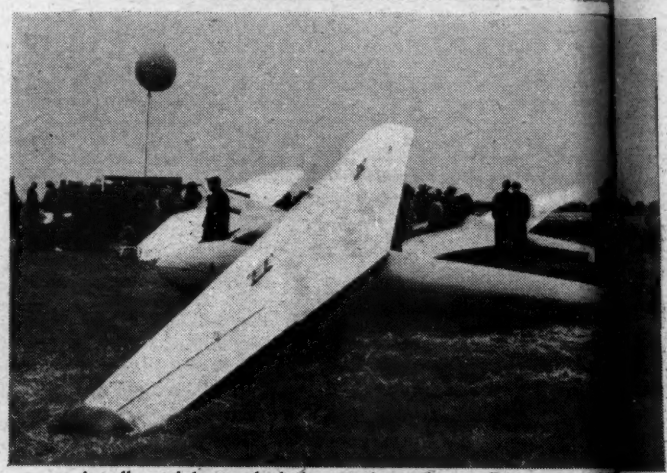


THE National Gliding Contests, which have been held at the R.N. Air Station—*H.M.S. Gamecock*—at Bramcote, Leicestershire, closed last Sunday after eight days' flying.

Philip Wills, the winner, took the lead on the first day of the meeting, which, incidentally, was not a good day, by making a goal flight to Dunstable and reaching a height of 9,900 ft. This effort gave him 264 points and put him so far ahead that he was never passed by any other competitor during the whole meeting.

Mr. P. A. Wills, winner of the contests.

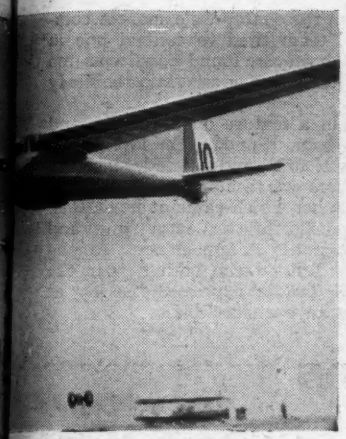
Monday was a poor day, but there was a little soaring in weak thermals—noticeably over the local power station—which must have gratified Mr. Shinwell. Tuesday proved a little better. All flights went northwards and two pilots reached their declared goal. These were F/O. R. C. Forbes (Weihe) who got to Catfoss, and S/L. Havercroft who



A yellow globe marked the starting point on Bramcote airfield. The glider in the foreground is J. S. Armstrong's pale blue Olympia.

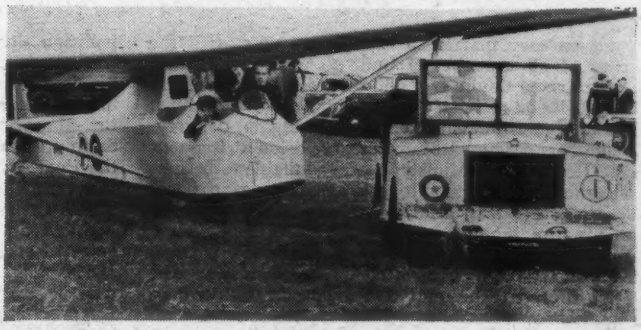
Competitors and friends. (Left to right) Mrs. Z. Paddon, Rex Young, Keith Turner, and F/Lt. W. Jennings. On the right is Mrs. Ann Douglas, competitor and chairman of the B.G.A. Contest Committee.

"Flig tographs



C. L. Faulkner's Cambridge blue mpia is just airborne over the cut hay e airfield. (Above) The scarlet and Weihe, belonging to the Surrey ng Club, drops its wheels on take-off.

The glider park is a study in sleek lines, graceful angles and cheerful colours. The Olympia in the foreground has its spoilers extended.



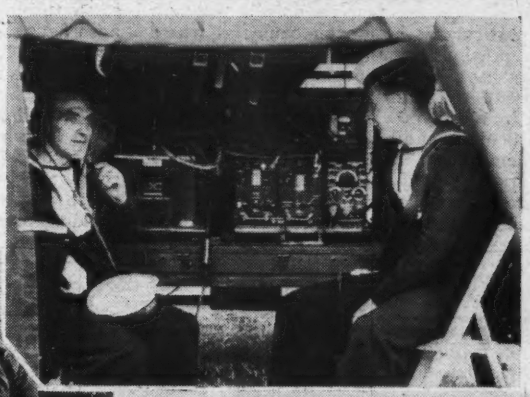
RESULTS.

Individual Prizes.

First : P. A. Wills (Weihe) 610 Points.
Second : Cdr. C. Nicholson (Nav. Lt. Cdr. Blake). (Kranich II) 481 points
Third : F/O. R. C. Forbes and S/L. Ian Bourne (Weihe) 418 points.

Club Prizes.

First : Surrey Gliding Club (Weihe) 285 points.
Second : Surrey Gliding Club (Olympia) 282 points.
Third : Cambridge University Club (Olympia) 273 points.
Firth-Vickers Trophy : C. P. Ellis (Slingsby Gull).
The E.O.N. Cup : D. F. Greig (Olympia).
Londonderry Cup : R.N. Soaring Assoc. (Kranich).
L. du Garde Peach Trophy : R.N. Soaring Assoc. (Kranich).
Daily prizes of £10 and £5 were also awarded.



The A.T.C. bring their two-seater—painted in vivid trainer yellow—on the scene by the aid of an armoured car.

Part of the enormous amount of voluntary work put in by all ranks of H.M.S. *Gamecock* (Bramcote air station) was a radio and telephone exchange at the starting point.

(Above) T. Horsley and L. Slater, the nominated pilots for Viscount Kemsley's cream Olympia. (Right) Naval gliding party. Lt. (A) Clark, Lt. Cdr. (E) Blake, and Cdr. C. Nicholson of the Royal Navy Air Command Soaring Association which did so well in the contests

National Gliding Contests . . . . .

made the 70 miles to Finningley in an Olympia. An aggregate of 1,120 miles was flown and Nicholson and Blake made a new altitude record for two-seaters by reaching 6,700 ft.

The best day of the whole meeting was Wednesday, when an aggregate of over 2,000 miles was flown. A west wind was blowing, and on reaching the east coast, competitors had to descend. There were 12 flights each of over 100 miles, and all but two of these reached their declared goals. The longest flight was one by Philip Wills of 130 miles, but he missed his declared goal of Caistor by three miles. Stephenson got the most marks with a 126-mile goal flight to Beccles. A Swiss team which attended the meeting *hors concours* set up new Swiss records with a single-seater goal flight of 117 miles, and a two-seater flight of 125 miles.

Thursday was only a moderately good day, and about 850 miles were flown. Gardiner, on his blue Olympia, brought off a nice goal flight to Doncaster (72 miles) and Ann Douglas tried the Swiss two-seater S.25 Spahlinger, landing at Full Sutton, Yorks. The violent thunderstorms of Friday carefully avoided Bramcote—the only place where they would have been reasonably welcome. A competitor from the B.A.F.O. team tried to contact one in the distance but the pilot, however, found conditions too hazy to see the structure of the storm or ascertain the likely situation of good thermals.

Distant storms were again a feature on Saturday, and nobody was able to reach them. Sunday, the last day of the meeting, was unprofitable until midday and, since the meeting closed at 4 p.m., there was insufficient time to take advantage of the better weather which came at lunchtime.

The week had proved delightful for everybody, and numerous important visitors put in an appearance. Among these were Lord and Lady Tedder who both flew in the Slingsby two-seater. Lord Tedder expressed his joy at getting back once more to an open cockpit.

Civil Aircraft Types

Progress Summary of Existing Designs

IT is not an easy matter to keep up to date with the progress of all the aircraft built to the specifications of the Brabazon Committee and others sponsored under the Civil Aviation Ministry's development programme. In particular, the estimated dates for first flights, delivery, and the numbers ordered are subject to revision at frequent intervals. Recently the Ministry made available some new facts concerning the types built to Brabazon specifications, and these, together with information about contemporary civil designs, are tabulated below.

In future only the first prototype of the Bristol 167 will be called Brabazon, which is, in fact, to be its name. The three other aircraft to be built to this specification will be known by their own names as decided by the Bristol Company. This course is suggested very sensibly in order to avoid confusion, particularly in foreign countries where the various Marks previously grouped under the general name of Brabazon have been thought to be modified versions of the Bristol 167 Brabazon I.

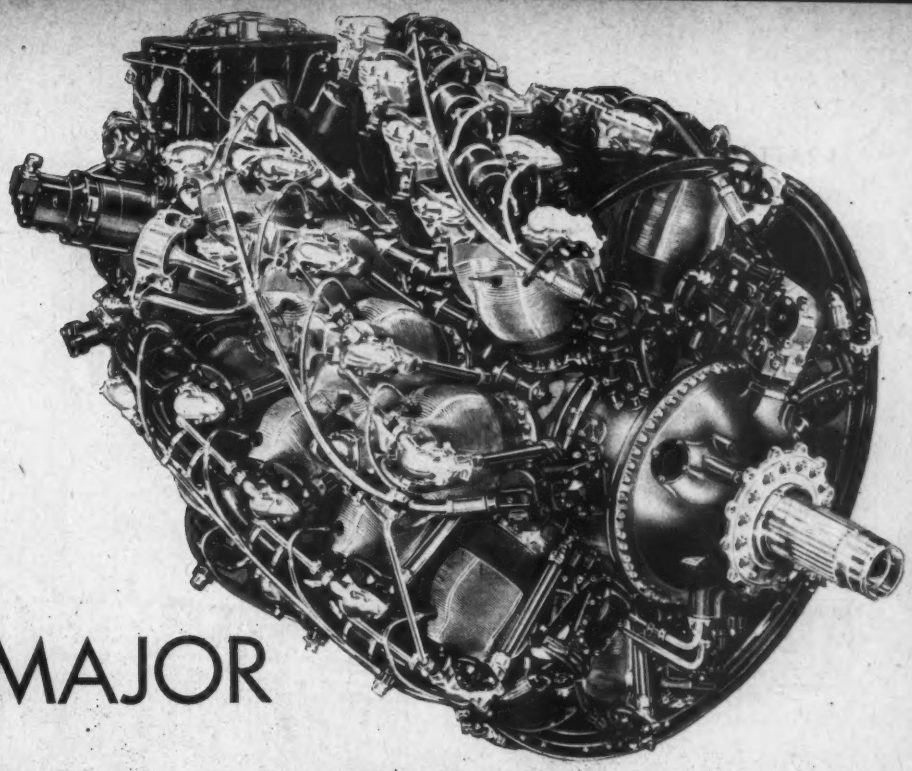
Some deviation from the previously announced orders will be noticed, particularly of aircraft for British European Airways. A few months ago there was some controversy between the Ministry of Supply and B.E.A.C. concerning some twenty Wayfarers on allocation to the Corporation. Following some exhaustive tests of the aircraft, the Corporation decided that in its present form the Wayfarer was not suitable for their routes as it did not reach certain required operating standards. Since the order was placed before B.E.A.C. existed, the Corporation refused to accept the allocation. It is understood from the Ministry of Supply, however, that tests are continuing to improve the single-engined performance and, in consequence, eight Wayfarers and six Freighters remain on the allocation to B.E.A.C. An entirely new allocation is the six aircraft for B.S.A.A.C., and the Corporation strongly deny any knowledge of such an order.

The Marathon position is slightly different in that, whereas twenty-five Mark Is (Gipsy) and twenty-five Mark IIs (Mamba) were ordered, the fact that the Mamba airscrew turbines are not yet available and that the performance figures of the Mark I with Gipsy engine are very encouraging the Corporation have decided to take thirty of the Mark Is and the order for the Mark IIs is to be left in abeyance.

Tender designs have been prepared by various firms for a type, known as M.R. (E) the specification of which may not be disclosed, and these are now being examined. The sponsored types mentioned earlier are those aircraft for which a specification has been approved and the cost of building prototypes is to be borne by the Ministry.

Maker's Name and Type	Aircraft Name or Type Name	Engines	First Flight	Orders (P = Prototype)	For Whom	Remarks
Bristol 167 Mk. I ...	The Brabazon ...	8 Centaurus	Early 1948 ...	1 P	—	Brab. Spec. No. I.
167 Mk. II	(to be decided) ...	4 Proteus	Mid 1949 ...	1 P + 3	B.O.A.C.	
Airspeed						
AS.57	Ambassador I ...	2 Centaurus	July 1947 ...	1 P	—	Orders to be decided after flight.
AS.57	Ambassador II ...	4 airscrew turbines (? Napier Niads)	—	1 P	—	Brab. spec. No. IIa.
Vickers VC-2	Viceroy	4 airscrew turbines (Dart or Mamba) ...	Mid 1948 ...	2 P	B.E.A.C.	Brab. Spec. No. IIb. Viking Replacement on European Routes.
A.V. Roe	—	4 airscrew turbines. ...	—	—	—	Brab. Spec. No. III. Doubtful if project will be continued.
De Havilland DH 106	DH 106	4 Ghosts	Early 1950 ...	Number secret.	B.O.A.C. and others	Brab. Spec. IV Similar to Brab. Spec. III.
Miles M.60	Marathon Mk. I ...	4 Gipsy Queen 71s ...		3 P + 50	20 private sale ...	Brab. Spec. Va. Mamba version
	Marathon Mk. II ...	4 Mambas	Late 1947 ...	—	30 for B.E.A.C. ...	delayed.
De Havilland DH 104	Dove	2 Gipsy Queen 70s ...	September 1945	Prod'n.	Private sale ...	In series production. Brab. Spec. No. Vb.
Armstrong-Whitworth A.W.55	Apollo...	4 Mambas	Late 1948 ...	2 P	—	Renamed (from Avon).
Bristol 170	Wayfarer Mk IIA ...	2 Hercules 632 ...	December 1945	2 P	8 Wayfarers and	
	Freighter Mk I ...			23	2 Freighters for B.E.A.C. 6 Wayfarers for B.S.A.A.C.	
Cunliffe-Owen ...	Concordia	2 Leonides LE.4M. ...	May 1947 ...	2	2 for B.E.A.C. ...	
Percival	Merganser	2 Gipsy Queen 51s ...	May 1947 ...	1 P	—	Production delayed in favour of Prince.
A.V. Roe	Tudor I (III and IV)	4 Merlin 600 series ...	June 1945 ...	2 P + 22	3 for B.S.A.A.C. 2 for V.I.P. work. ...	III for V.I.P. IV for B.S.A.A.C. (one with 6ft. nose extension).
A. V. Roe	Tudor II (V and VI)	4 Merlin 600 series ...	March 1946 ...	2 P + 44	B.O.A.C. B.S.A.A.C.	V and VI for B.S.A.A.C. and F.A.M.A.
A. V. Roe	Tudor VII ...	4 Hercules	Early 1947 ...	1 P	—	II with Hercules engines.
A. V. Roe	Tudor VIII	4 Nenes	September 1947	1 P	Experimental ...	For High-altitude tests.
Short	Solent	4 Hercules 637s ...	December 1946	12	B.O.A.C.	Civil version of Seaford.
Vickers IB	Viking	2 Hercules 634s ...	June 1945 ...	Prod'n.	B.E.A.C.	In production. One to be fitted with Nenes experimentally.

3,500 h.p. RADIAL



Pratt & Whitney

WASP MAJOR

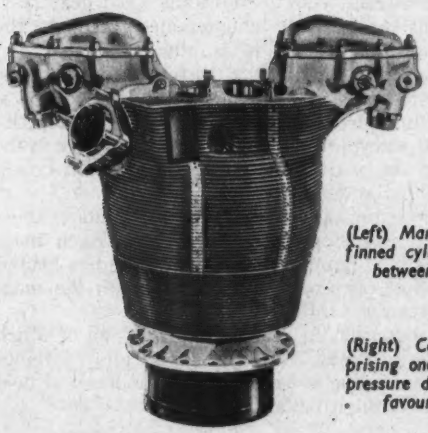
WORLD aircraft engine development at the beginning of the war was chiefly directed towards the production of more power both for military and commercial aircraft. The then key figure of 1,000 h.p. was only available from very few units and the most common layouts among the large designs had 9 or 14 cylinders radially arranged, or 12 liquid-cooled in vee form. After some eight years, designers of transports are still unable to get all the power they would like without turning to gas turbines. An output of 3,000 h.p. or better from a large piston engine is still the exception rather than the rule.

Because airscrew-driving turbines, having lost most of the simplicity of the pure jet unit, are unfortunately taking much longer to develop to a practical commercial stage than was at first optimistically estimated, and because, in America in particular, such units have not yet reached as advanced a stage of development as the British designs, a great deal of effort is still being concentrated there on the design and development of very large piston engines. Even in this country there is evidence in commercial aircraft of a tendency to revert for a year or two more to multi-cylinder piston engines in spite of their weight and complexity. Quite recently the Rolls-Royce Eagle, with 24 cylinders arranged in H form, was announced. So far this largest British unit of 46 litres capacity, developing 3,500 h.p., has been applied only to one specific Naval aircraft. The power problem of the Bristol 167 Brabazon has been solved rather differently—namely, by coupling 18-cylinder radial Bristol Centaurus XXs in pairs, to produce, in effect, 5,650-h.p. units with a paired capacity of 107.2 litres. The largest aircraft piston engine, excluding the coupled type, to be built to date, is the American experimental 36-cylinder Lycoming XR.7755, designed to give 5,000 h.p. It is a radial arranged in four rows of nine cylinders each.

A very interesting and promising example of the exceptionally large American piston engine design is the 3,500 h.p. Pratt and Whitney Wasp Major, which is the power unit of such important new aircraft as the Globemaster, Constitution, Stratocruiser, XB-35 flying wing, six-engined XB-36, Mars flying boat, etc.,

Conceived in 1940, and actual design started in November of that year, the first unit was run in April, 1941. This extraordinarily short period indicates to some extent the tremendous resources of the Pratt and Whitney Company, but it was also made possible by the incorporation of many proved components from other Pratt and Whitney engines. About one year later the Wasp Major flew, and a successful 150-hour type test was completed in December, 1944, by which time the unit had 12,000 hours' development running alone to its credit.

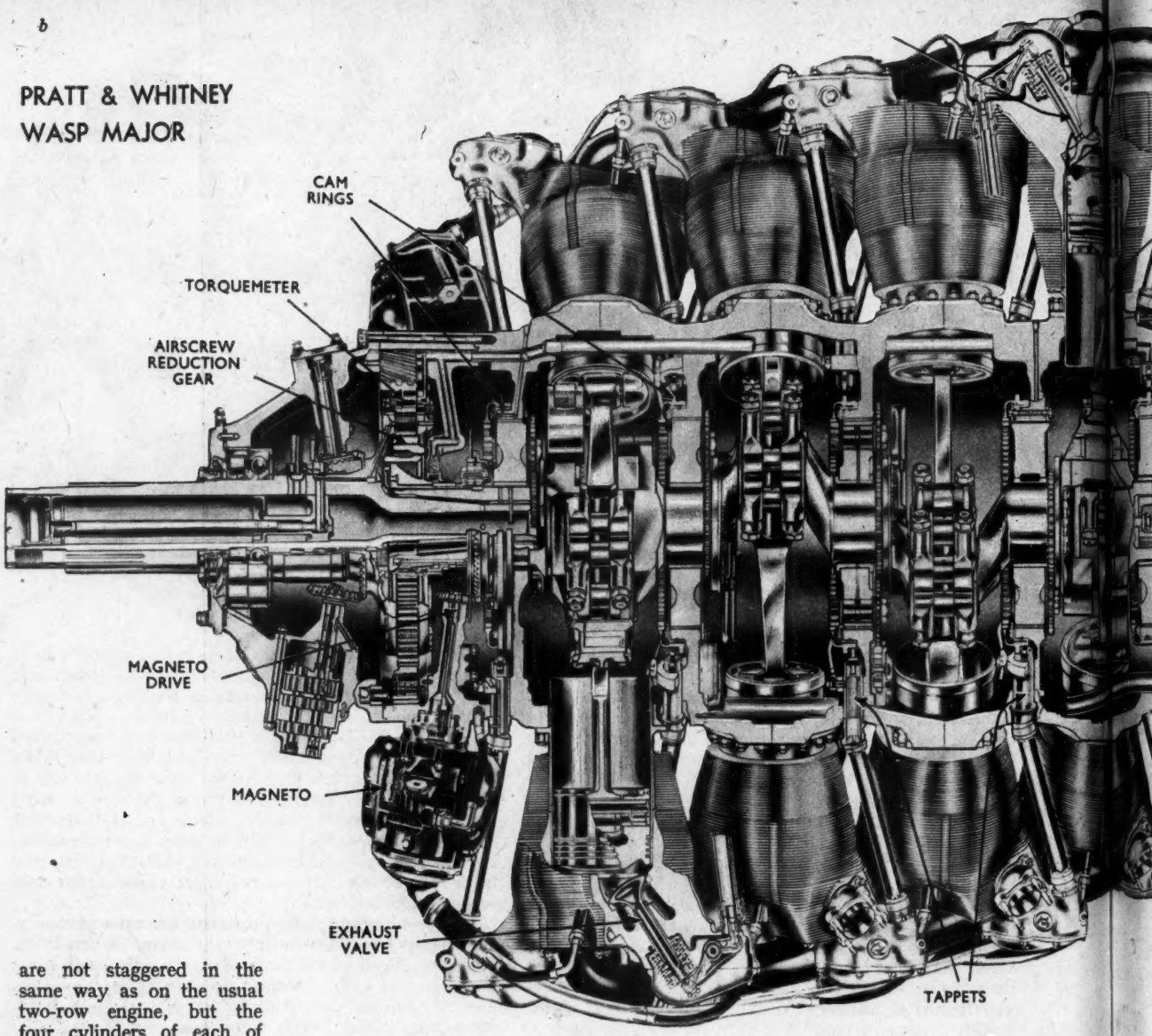
The Wasp Major is a 28-cylinder air-cooled radial arranged in four rows, each of seven cylinders. These



(Left) Many years of development have led to this heavily finned cylinder and head design. The intake port is between the rocker boxes in the top of the head.

(Right) Cooling airflow through four cylinders, comprising one of the seven fore and aft banks. The air pressure drop required for cooling is said to compare favourably with that needed for two-row engines.

PRATT & WHITNEY WASP MAJOR



are not staggered in the same way as on the usual two-row engine, but the four cylinders of each of the seven fore - and - aft banks are arranged helically around the crankcase. This permits the maximum quantity of cooling air to reach the barrels while creating the lowest cooling drag due to changes in direction of flow, and it also makes for accessibility of sparking plugs, ignition harness, etc.

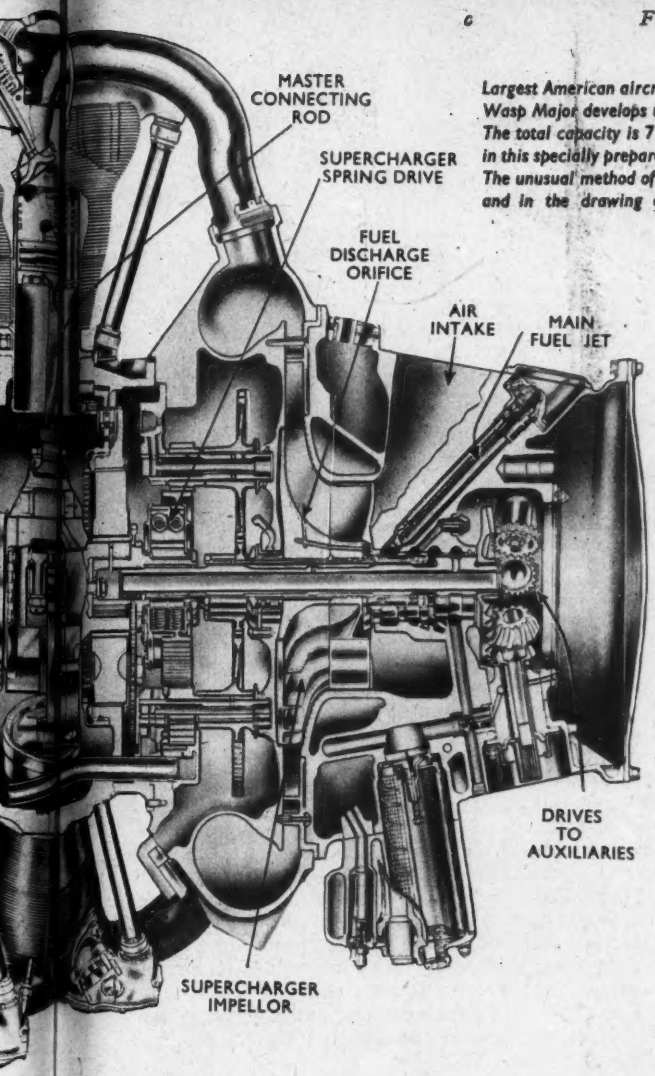
Composition

An exploded view of the engine would, from front to rear, reveal the main structural units to be: reduction gear, magneto section, five crankcase divisions (power section), supercharger, accessory drive casing and carburettor. The reduction gear is of the sun-and-planet type. The airscrew shaft is carried in a plain lead-bronze bearing at the rear end, and at the front end a roller bearing and a deep-groove ball bearing absorb the radial and thrust loads. In the nose of the casing is the fully feathering, reversing, constant-speed unit.

Provision is made for a torquemeter, the components of which are integral with the reduction gearing. The fixed or sun gear is located in its case by means of external helical splines on its periphery which engage with corresponding splines on the inside diameter of the casing. The direction of the splines is such that the driving torque transmitted through the pinions of the reduction gear train tends to force the fixed gear rearwards. This pressure is counteracted through the medium of pistons housed within the fixed gear and operated by oil pressure. When the rearward thrust due to torque is balanced, oil pressure behind the piston is transmitted through a diaphragm to a closed column of oil connected with the torquemeter pressure gauge in the cockpit, and the shaft horse-power under flight conditions may thus be determined.

A cast magnesium case supports the seven interchangeable Scintilla magnetos and their drives. Each magneto provides dual ignition for the four cylinders behind it through short, screened leads which, with the magnetos, are pressure ventilated.

The five sections of the crankcase proper, all of which are substantially similar, are aluminium alloy forgings split at the centre line of each row of cylinders and held together with through bolts.



Largest American aircraft power unit to reach the production stage, the Pratt and Whitney Wasp Major develops up to 3,500 h.p., or 125 h.p. from each of its twenty-eight cylinders. The total capacity is 71.5 litres. The many interesting design features may be studied in this specially prepared illustration of the TSB3-G, the single-stage single-speed version. The unusual method of injecting fuel from between impeller blade roots may be seen here and in the drawing on the next page of the model VSB11-G with variable-speed supercharger.

Several features of cylinder design may be unfamiliar to readers in this country, but the cylinders, which are completely interchangeable, may be considered as an advanced development of earlier P. and W. designs. Double-Wasp pistons with reinforced internal bosses are employed. The valves, two per cylinder, are arranged in the fore-and-aft position, the inlet valve being in front and the exhaust valve at the rear. All the valve gear is, of course, fully enclosed, and the rocker boxes are a part of the head casting. Their covers and the sparking plugs protrude through the hooded pressure baffles around the cylinders. Plain rocker arm bearings are used and oil pipes interconnect the four inlet and four exhaust boxes fore and aft in each bank. Air intake is through the top of the cylinder head but the exhaust leaves from the port rear side. In keeping with current American practice, a finned muff of forged duralumin is shrunk over the cylinder barrel, and its finning is such that there is no break between the muff and the deep, closely spaced fins machined in the forged alloy head. This is said to be conducive to a uniform temperature gradient.

Between the rows of cylinders individual double-track cams operate the exhaust valves of the row ahead and the intake valves of the row to the rear. Single cams at the front and rear of the crankcase power section operate their appropriate valves. The cams are driven direct from the crankshaft by spur gears at one-sixth crankshaft speed.

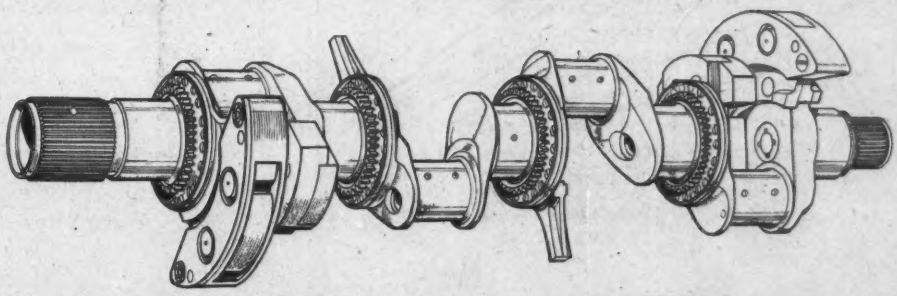
A one-piece forged steel crankshaft is employed, which has four throws and is supported by five steel-backed lead-silver-indium main bearings. A special study has been made of vibration throughout the engine, and the crankshaft with two small fixed and two floating counterweights is extremely good from this point of view. The special suspension by means of vibration isolators prevents any remaining vibration from being transmitted directly to the airframe.

Two Types of Supercharger

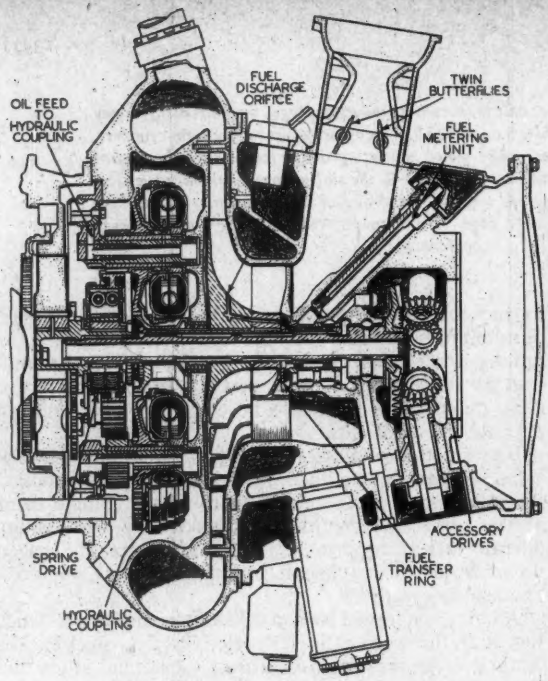
Details of the superchargers for the Wasp Major are still somewhat restricted, but the two basic types are a single-stage single-speed unit suitable for use with an exhaust-driven supercharger (TSB3-G) and a single-stage hydraulically driven variable-speed supercharger (VSB11-G).

The United Aircraft Corporation have recently patented a special type of hydraulic drive for superchargers, and it is probable that the principle as explained in the patent specification is employed on the VSB11-G Wasp Major. Hydraulic transmission presents some problems for an impeller required to operate over a wide range of speeds, because it can only be efficient when the difference in speed of the two members is low. To combat this weakness, two independent units or pairs of units are provided, working in conjunction with a high- and a low-geared countershaft and operating at low slip over a fairly narrow range of speeds. A satisfactory range of impeller operational speeds is then obtained with efficiency by engaging the units in sequence.

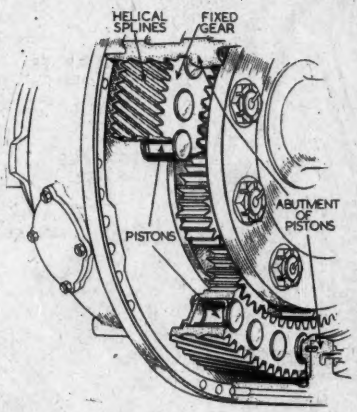
Automatic operation is achieved by control of the working fluid so that changes of manifold or atmospheric pressure, by their effect on a pair of bellows, cause a pump to charge or empty the couplings. When one coupling is transmitting the drive, the other is emptied of fluid and therefore idles. The fluid is circulated continuously through whichever unit is under load.



Counterbalance weights and torsional vibration dampers are both used on the four-throw crankshaft. The crank pins carrying the master rods are set just off the 180 deg angle and the gears are for the cam rings. The shaft is a one-piece steel forging.



A rather unusual and interesting feature of the Wasp Major VSB11-G is the variable-speed hydraulic drive for the supercharger impeller. Some details of the couplings, spring drive and fuel passages are shown on the left.



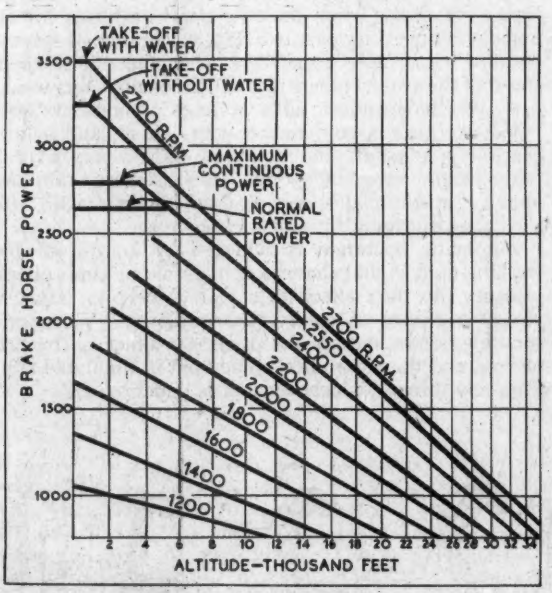
All large American power units are now equipped with torquemeters. On the Wasp Major (above) this device is incorporated in the reduction gear. Small pistons, seen in the main sun gear, transmit driving torque (which has been translated into rearward thrust in the gear) to a diaphragm and a closed column of oil, which in turn actuate the torquemeter pressure gauge in the cockpit.

The impeller is made up of an entry section known as the inducer, and the impeller proper with straight blades. Fuel is induced through discharge orifices located between the roots of the impeller blades. It is fed through to a transfer ring in the hub of the inducer and then via drilled passages to these holes. Excellent vaporization and centrifugal distribution is obtained in this way.

A pressure-type four-barrel Stromberg carburettor is fitted, which feeds metered quantities of fuel through internal passages to the transfer ring already mentioned. After leaving the supercharger the mixture is carried to the cylinders through seven four-branch manifolds.

Accessory drives are arranged rather differently from those on most British power units. They are radially mounted around the rear casing, and certain accessories, such as generators and starters, can be interchanged or exchanged for others after the installation of proper couplings. An intermediate gear box is needed if hydraulic or vacuum pumps are to be attached. The flat rear cover is held to be an advantage in permitting the fire wall to be located close up to the rear of the engine without interfering with servicing points, and the radial mounting of the main engine accessories is said to be desirable from the maintenance point of view. Extra accessories, cabin superchargers, etc., may be mounted on a remote gear box but a special rear cover plate providing a remote drive is then required.

The Pratt and Whitney Company believe that the Wasp Major will hold its own against turbine competition for many years to come as the power unit of long-range civil and military transports, and it is hoped that development and full use of the available exhaust energy will result in an increase in power output by as much as 1,000 h.p.



Power curves for the single-stage single-speed Wasp Major.

WASP MAJOR DATA

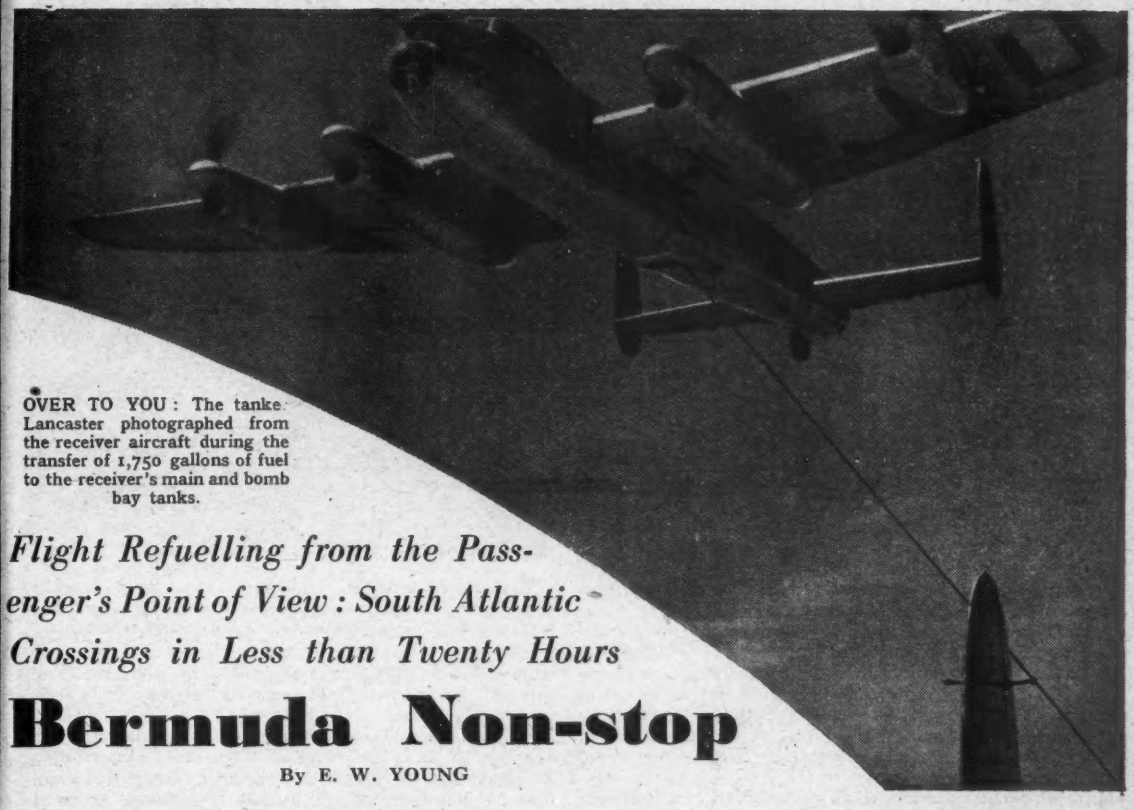
Bore	5.75in (146 mm)
Stroke	6.00in (152.4 mm)
Total displacement	4,363 cu in (71.5 litres)
Compression ratio	6.7 : 1
Max B.M.E.P.	200 lb/sq in
Airscrew reduction gear ratio	0.381 (or 0.425)
Airscrew shaft rotation (from rear)	Clockwise
Diameter : TSB3-G ; VSB11-G	53.5in ; 52.5in
Length	96.75in
Dry weight (including torquemeter and accessories) TSB3-G ; VSB11-G	3,490 lb ; 3,410 lb
Max. oil consumption at rated power	0.025 lb/b.h.p/hr

Performance

Power	b.h.p.	r.p.m.	Alt (ft)
Model TSB3-G (Single-stage, single-speed supercharger)			
Take-off power (with water injection)	3,500	2,700	500
,, ,, (without water injection)	3,250	2,700	700
Normal rated power	2,650	2,550	5,500
Max. continuous power	2,800	2,550	3,500
Model VSB11-G (Single-stage variable-speed supercharger)			
Take-off power	3,000	2,700	S.L.
Normal rated (low ratio) power	2,500	2,550	5,000
,, ,, (high ratio) power	2,200	2,550	14,500

Brake Specific Fuel Consumptions—lb/b.h.p./hr

Power	Model TSB3-G (Single Stage)	VSB11-G (Low and max. high speeds)	
Take-off with water (0.220)	0.580	—	—
,, without water	0.750	0.730	—
Per cent normal power 100	0.710	0.720	0.760
,, ,, 90	0.650	0.675	0.685
,, ,, 80	0.580	0.615	0.625
,, ,, 75	0.540	0.590	0.605
,, ,, 65	0.510	0.535	0.575



OVER TO YOU: The tanker Lancaster photographed from the receiver aircraft during the transfer of 1,750 gallons of fuel to the receiver's main and bomb bay tanks.

Flight Refuelling from the Passenger's Point of View: South Atlantic Crossings in Less than Twenty Hours

Bermuda Non-stop

By E. W. YOUNG

IT may be recalled that the technique of refuelling an aircraft in the air was reviewed very thoroughly in *Flight* some two years ago and the mechanics of the procedure will now be familiar to most readers; therefore, it is not intended in this account to go too deeply into that side of the question, but to look into the process from the passenger's point of view. It was with this idea in mind, and to gain first-hand knowledge, that I travelled as a passenger on service F.W.4—the fourth non-stop London to Bermuda flight in the present series of trials over the South Atlantic route. Before describing this, however, a brief account is called for of the history of this method of refuelling.

About fifteen years ago the idea of refuelling an aircraft whilst it was in the air first came under consideration. In those days it was tried out mainly as a "stunt," but later its commercial and military potentialities were realized and a serious study of the subject was undertaken. The idea was slow to find support and it seemed that something always occurred to delay its fulfilment as a practical routine procedure. Perhaps the biggest step forward was made just before the war when Imperial Airways operated their "C" class flying-boats on a North Atlantic experimental service and made use of flight refuelling soon after take-off. These experiments were unfortunately stopped by the outbreak of war, and further plans had to be shelved. Flight refuelling was reconsidered during the war against Japan, when an order was placed for several hundred tanker Lancasters and receiver Lincolns, but this time the appearance of the atom bomb put paid to what might have been a comprehensive try-out of flight refuelling in operation under war conditions.

Post-War Developments

As soon as the war ended, however, those who had faith in the "new" project saw in it a means of using our "stop-gap" civil aircraft on long-distance routes, and last winter B.S.A.A. crews started regular flying trials on three days a week, taking off from London Airport on specially equipped Lancastrians which were refuelled in flight by tanker Lancasters at various rendezvous almost regardless of weather. Those trials proved what was not then a certainty—that the operation could be carried out under nearly all conditions. Even so, this did not entirely satisfy A.R.B. and the Ministry of Supply, who demanded further

RESTING: The receiver Lancaster at Kindley Field, Bermuda, after completing its 3,860-mile non-stop flight via the Azores. Kindley Field is operated by the Americans on a ninety-nine year lease under a lease-lend agreement.

Bermuda Non-stop . . . . .

proof before they would consent to the method being adopted by airline operators, and so the present series of trials came about.

For three months, B.S.A.A. and Flight Refuelling, Ltd., under the aegis of the Ministry of Civil Aviation, are conducting one round trip each week to Bermuda, each leg being flown non-stop by taking on fuel in the air in the region of the Azores, which lie conveniently at almost the half-way point on the South Atlantic route. At the end of these trials a further series will be made by B.O.A.C. over the North Atlantic route, with probable refuelling points off the coasts of Ireland and Newfoundland. It is hoped that from these trials enough data and information will be collected to start regular flight-refuelled services over long-distance routes.

Figures and Farewells

The man behind the whole idea, who has been its main driving force from the start, is Sir Alan J. Cobham. Sir Alan's claim is that British airlines could, by employing flight refuelling, turn what are now national losses into money-making concerns. Flight Refuelling, Ltd., of which he is managing director, state that, assuming three flights per week throughout the year, then, at ordinary rates, the aggregate increment per annum would be increased by one million pounds at a refuelling cost of less than 1 per cent. This claim is based on the fact that a greater pay-load may be carried farther by "topping up" a machine's fuel tanks from a tanker aircraft at some stage or stages along the airliner's route. The force of this argument is brought home when it is considered that 1,000 gallons of fuel weigh approximately 3¼ tons, or the equivalent of thirty passengers and their baggage. Let us leave the financial side of the question to the statisticians and concentrate on the non-stop, flight-refuelled trip to Bermuda as I, in the role of an interested passenger, experienced it.

True to the normal passenger routine, the Airways Terminal coach left Victoria at 10 o'clock on a Friday morning and took me to London Airport, where the final preparations for the Bermuda flight were in progress. The weather looked none too promising; rain was beginning to fall, and I began to wonder what conditions would be like over the Azores. After satisfying the Customs officials whom, contrary to most reports, I found helpful and courteous, I met my fellow passengers in the passenger reception building, where we had a quick drink and a final cigarette—the last for nearly twenty hours, as smoking was not to be permitted in the receiver Lancaster. This rule, I hope, would not apply on large commercial airliners which might eventually be used on such a long-distance run. Handshakes and farewells completed, we climbed aboard the Lancaster which was to carry us the 3,860-odd miles to Bermuda in one long "hop."

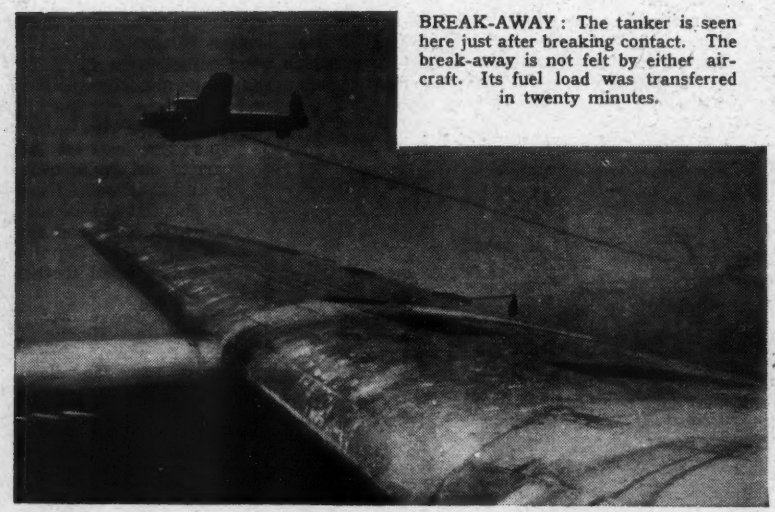
DISCUSSION GROUP: Capt. R. J. Cook (2nd from L.) and crew after landing at Heathrow, discuss the return flight with Capt. Gordon Store, operations manager, B.S.A.A.

I must digress here for a moment to point out that the aircraft we were to travel in was not ideal for pasenger comfort, and we experienced the trip, lasting 19 hr and 14 min., under cramped and austere conditions. At no place in the Lancaster, apart from on the flight deck, was it possible to stand upright, and the four bunks provided were primarily for the use of the crew. On a routine flight-refuelled service it is possible that Hermes or Tudor aircraft would be used. I am told that the installation of flight-refuelling equipment, which weighs only 300 lb, is a comparatively simple undertaking.

Airborne

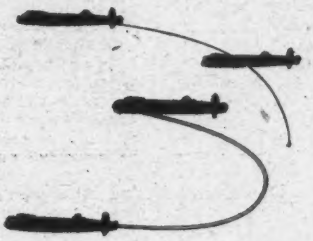
After warming up his engines, Capt. R. J. Cook, D.S.O., D.F.C., D.F.M., taxied out and as we left I noticed Sir Alan Cobham taking a keen interest in our departure. With 2,694 gallons of fuel on board we made a smooth and what seemed like a short take-off run, and at 700-800ft plunged into cloud on our climb to 10,000ft. Airborne at London Airport at 10.08 G.M.T., we levelled out forty-six minutes later between two layers of stratus and began our long wait until the monotony was broken, eight hours later, by the refuelling process. The only diversion from boredom came with the serving of meals on board, and one found oneself taking an abnormal interest in cold meat pies and frozen vegetables. I would stress here that if long hours must be flown by air travellers the meals should be made as interesting and varied as possible—it really does help.

As the time of interception by the tanker Lancaster drew near we all began to take a renewed interest in events, and necks and eyes were strained to "find" our consort. In actual fact it "found" us; almost magically to the uninitiated but, in fact, very scientifically with the aid of Eureka/Rebecca. The development



BREAK-AWAY: The tanker is seen here just after breaking contact. The break-away is not felt by either aircraft. Its fuel load was transferred in twenty minutes.

of radar aids has, of course, enabled the interception procedure for flight refuelling to be brought near to perfection, and as far as the rendezvous is concerned there is little to worry about. The tanker, having appeared quite suddenly through a 10/10ths layer of stratus beneath us, formated neatly on our starboard side, slightly below and astern of our aircraft. Before it arrived the refuelling engineer, who had taken up his station in the tail, had trailed our hauling line and grapnel and about 260ft of it now curved in a graceful arc behind us. From the harpoon-like gun of the tanker the projectile, with its contact line attached, shot out beneath and at about 90 deg to our hauling line, and immediately made contact with the pawl and grapnel. Electrical potential is neutralized at the moment of contact on a bare portion of both lines, and the two aircraft are then bonded together throughout the operation. It was only a matter of minutes before the pipeline had been wound to our aircraft and secured in the coupling in the tail, the tanker had taken up its position above us, the system had been flushed through with nitrogen to prevent fire, and 1,750 gallons of fuel were being gravity fed into our No. 1's and bomb bay tanks. The tanker formated with our aircraft at 18.30 G.M.T., contact was secured by 18.35 and contact broken by 18.55. The whole procedure was over in twenty-five minutes and its performance was so smooth that had I not been specially watching for it I should not have known anything unusual was happening. However, I cannot help but feel that the normal passenger would be apprehensive when he saw the tanker linked by pipeline to his airliner, despite any reassurance he may have received before the start of the journey. One method of overcoming this is to fly the tanker in line astern and pump the fuel through the pipeline. I understand that this method is under consideration.



Tanker and receiver shown in their relative positions for making contact (above) and passing fuel.

Apart from the refuelling process the rest of the trip was carried out normally. It took us about another eleven hours to reach Bermuda, where we landed at Kindley Field, a fine air base built by the Americans. It was certainly good to be on the ground again after such a long and gruelling trip. We were all very tired and very much appreciated our reception in Bermuda, where everything was laid on for our comfort by W/C. Dick Ralph, who is now B.S.A.A. Station Manager there. Considering the fact that it was 3 a.m. local time it was gratifying to proceed through Customs and currency departments with the minimum of red tape, and after an excellent breakfast of eggs and bacon we were soon asleep. We had been in the air over 19 hours and, while fully admitting that flight refuelling would give our present-day aircraft added endurance, I feel that a machine which is to fly non-stop over long routes should be especially designed for the purpose, with promenade decks, passenger radio, cinema screens and every possible aid to passenger contentment. After experiencing such a lengthy non-stop journey in the modified Lancaster I must confess that even an hour's stop at the Azores would have been indeed welcome.

In Bermuda, where we stayed exactly 39 hours before making the return trip, I took the opportunity of visiting Darrells Island, the B.O.A.C. flying-boat base from which three Boeing boats leave every week for Baltimore. After inspecting one of these spacious aircraft I envied its passengers. I would gladly sacrifice speed for comfort—and that I think would be the reaction of most passengers travelling on a flight-refuelled service.

NO RECORD ATTEMPT THIS YEAR

LAST week it was officially stated by the Ministry of Supply that no attempt would be made to regain the air-speed record this year. This, it was added, was in keeping with our original policy, which has therefore been unaffected by the capture of the record by the American Shooting Star. Depending upon how our new jet designs shape during the next few months, it is more than probable that an attempt will be made next year. The six-year-old Meteor is known to be near its limit, but there is little doubt, as pointed out in some detail last week, that if taken to a course near the Equator, and without any increase in power since it achieved its previous record of 616 m.p.h., it would be capable of bettering its own speed by 25 to 30 m.p.h. As alternatives to the Meteor there are the D.H. 108, which has been tested up to a Mach number in excess of that which would be required to take the record, the Attacker and at least one other design, at present on the secret list.

THE RECORD HOLDER: Col. Albert Boyd, chief of Flight Testing Division, Air Material Command, Wright Field.

In answer to questions, it was stated that the official opinion was that the benefit which might result from the recapture of the record by a small margin this year did not justify the immediate planning of an attempt. It was added, incidentally, that the single-engined Gloster project had now been abandoned.

There is no doubt that this official pronouncement will come as a disappointment to many people, and it seems unlikely that an attempt on the record could be made as a private venture, although presumably this possibility is not entirely excluded by the M.o.S. statement.

NOVEL NAVIGATION RULER

AN ingenious navigational ruler and protractor has been designed in Denmark by Aage Gade who is head of the Navigational Department of the Sports Flyve Klubben, Copenhagen. It is attractively produced in Perspex and, in addition to the usual ruler graduated in kilometres or miles for 1 in 500,000 maps it has an unusually arranged protractor scale and in the centre portion, curves relating to speed and time.

Each of the special functions of the device are simple to understand and are intelligently contrived. However, a difficulty is the need to move one or other scale in relation to and parallel to the track line on the map.

The coloured markings are not sufficiently clear when backed by the standard coloured map and the risk of reading reciprocals in error on a normal protractor is not sufficient to justify the double action required to read this new type reversed scale.

As an example of the use of the curves: an aircraft is assumed to have flown from starting point a, to b on track in ten minutes and the pilot wishes to know his ground speed. The ruler is placed on the map parallel to this line a b in such a way that the zero mark on the horizontal distance scale coincides with a. The ruler is next displaced while remaining parallel to a b until the ten minute line cuts point b. The ground speed can then be read off against a. A similar sequence of actions will give flying time if ground speed is known.

It is understood that R. K. Dundas, Ltd., of 4, St. James's Street, London, S.W.1, will deal with enquiries.

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Industrial Application of Gas Turbine

Courses of Instruction Arranged by the National Gas Turbine Establishment

DESPITE rapid progress and outstanding achievement the design, construction and operation of the gas turbine must still be regarded as a new art. Much of the development was effected under the essential secrecy of the war years and was in the hands of relatively small groups. Whilst theory is drawn largely from older subjects such as thermodynamics and aerodynamics, established educational institutions are not yet equipped or staffed to supply "transitional" instruction to existing engineers or to teach the incoming generation.

In addition to its many other duties and functions, an important activity of the National Gas Turbine Establishment has been the institution of a series of instructional courses on the aircraft turbine for Service, scientific and manufacturing personnel. Up to the present time twenty such courses have been completed and about 400 students have passed through. Initially, a course extending over six weeks was arranged but, as a substantial proportion of the "students" were senior executives of large firms who found it extremely inconvenient to absent themselves for such a period, it was compressed into an intensive course of two weeks.

One course was reserved exclusively for foreigners. Twenty students came from eight countries, including Belgium, China, France, Switzerland and U.S.A. These aircraft turbine courses are being continued and to date applications for enrolment have accumulated for at least four more courses.

It must not be thought, however, that the National Gas Turbine Establishment is exclusively concerned with the aircraft gas turbine. In 1943, when the Government acquired Power jets, of Whetstone, and detached the R.A.E. team at Pyestock to form the Power Jets Research and Development organization under the chairmanship of Dr. H. Roxbee Cox, it was stipulated that it was to conduct research on land, sea and air applications. When, in the following year, this organization was transformed into a Government department, the National Gas Turbine Establishment, this general aspect was re-emphasized.

Since the termination of hostilities an increasing proportion of the Establishment's facilities and energies have been devoted to the investigation of problems relating to heavier and larger scale plants for power generation, naval and mercantile marine propulsion and locomotives.

Both in this country and abroad there is intensive activity in the development of gas turbines for industrial purposes. A number of leading British firms are at present actively engaged on projects. As a consequence, the need has arisen for instruction in these specialized branches of the art which, of course, are not adequately met by the existing aircraft turbine courses. Accordingly, the N.G.T.E. has now arranged, under the leadership of S/L. W. R. Thomson, a one-month course on the industrial applications of the gas turbine.

The first course commenced on June 30th and according to plan it will be repeated in the autumn. At present the enrolments for the autumn course are about two-thirds of capacity. The lecturers will be members of the N.G.T.E. and specialists loaned by various firms engaged in the manufacture or development of gas turbine units. The courses are held at the N.G.T.E., Ladywood Works, Lutterworth, and the students are accommodated under what are termed "hostel" conditions. Applications for enrolment should be made to S/L. W. R. Thomson at Lutterworth. The cost of the course, inclusive of board and accommodation, is £60. For the two weeks' course on aircraft turbines the charge is £30. The courses are of a post-graduate character and the enrolments are subject to selection to spread the value of the courses over the Services, research and educational organizations and industrial firms.

The De Havilland Beaver

Canadian Aircraft for Bush Pilots

LAST November plans were made by the de Havilland Aircraft Co., of Canada, for the production of an aircraft to meet the requirements of bush pilots operating in the Northern territory, of Canada. Resulting from these plans the de Havilland Beaver is expected to make its appearance this summer.

The Beaver is to be an all-metal, high-wing, semi-cantilever monoplane with skis, floats or wheels as alternative landing gear. Two versions are to be produced, one powered by the de Havilland Gipsy Queen Series 50 engine of 296 h.p., and the other by the Pratt and Whitney Wasp Junior of 450 h.p. Because Wasp Junior engines are available from war surplus stocks, that model will be developed and flown first. The Beaver has an all-up weight of 4,600 lb as a seaplane and 4,400 lb as a landplane. The engine mounting is of welded steel tube and the front portion of the fuselage is a tubular structure with removable metal coverings for ease of servicing and maintenance of controls, accessories and instruments.

The rectangular wing has single bracing struts and slotted flaps extend from the fuselage to the ailerons, which occupy the rest of the span. 40 deg of flap downward travel and 15 deg downward travel of aileron are used to improve take-off and angle of climb. Provision will be made for one pilot and three passengers, though the seat beside the pilot position will be removable and the flooring reinforced for the carriage of freight. Further baggage space is to be provided behind the rear seat, and a separate locker for emergency bush kit is also planned. A thoughtful feature that will appeal to many bush pilots is the intended provision of two hatches, one on the underside of the fuselage, another in the rear cabin wall, through which long pieces of freight may be easily stowed. Extra-wide rear doors, flush fitting to the flooring, will also facilitate the handling of freight.

The Pratt and Whitney Wasp Junior develops 450 h.p. at take-off and gives a cruising speeding of 146 m.p.h. at 5,000ft with 300 h.p.; economical cruising at the same altitude is expected to be 133 m.p.h., with 240 h.p. The figure given for the rate of climb at sea level, using 450 h.p. at 80-90 m.p.h., is 1,425ft./min. Absolute ceiling is approximated as 19,500ft. The take-off time is calculated to be 11 sec with 40 deg of flap, using 515ft of runway, although, of course, these figures will depend upon existing conditions

Three removable fuel tanks are located in the fuselage belly, suspended from the floor structure, but only two of these tanks are used for the normal range. They are filled from a convenient position in the side of the aircraft so that refuelling may be accomplished by standing on the ground or on the port float, and there is no need to clamber up on to the wings. An oil cooler and an oil tank of sufficient capacity for the extra range are provided and an oil dilution system, almost a necessity for the cold winters of Canada, is fitted. An aggregate of 80 gallons will give a range of 530 miles at 10,000ft.

Disposable load on the landplane version of the Beaver will be 1,986lb with gross weight at 4,400lb, making an allowance for baggage of 759lb. Figures for the disposable load on the seaplane version are slightly lower

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FRENCH RALLY

THE Aero Club of Versailles have now announced the programme for their International Light Aircraft (maximum 4-seaters) Rally to be held at Toussus le Noble over the week-end of August 2nd, 3rd and 4th. At the present time all entries must be received by July 10th, but it is hoped that this date may be extended in view of the short notice. Entrance fees are 2,000 francs per aircraft and 5,000 francs per person, but it is pointed out that these sums cover all expenses including hotel, meals, transport, entertainment, and aircraft fuel—also, of course, entrance to the various competitions. There is an advantage in taking a full complement of passengers in that a bonus of ten points per passenger is given in the arrival competition.

"THERE WE WERE UPSIDE DOWN!!"

WE would not guarantee to be able to differentiate between the top and bottom of every printing machine, and not every printer knows that the Merlin on a D.C.4M is underslung. That quite simply explains the cause of the 9,350ft "no deception" line by our photographer. There are still one or two readers who have not written or telephoned to point out the inversion of the block on page 609 of last week's issue, so may we take this opportunity of thanking those who have told us about it, of acknowledging the error and of saving any others the trouble of letting us know.

CIVIL AVIATION NEWS

PRIVATE ENTERPRISE. The Terminal building at Speke Airport, Liverpool, which was constructed before the war by the City Corporation. A Consul belonging to the charter company, Ulster Aviation, Newtownards, Northern Ireland, is seen starting up.

B.E.A. Comparison of Air and Surface Travel Figures : Q.E.A. Plans for Empire Air Route : Advisory Council Members

SAVING TIME AND SOMETIMES MONEY

IN *Flight*, March 6th, some interesting figures were quoted from a speech by Sir Harold Hartley, chairman of B.E.A., comparing times spent travelling by air and by surface transport, and the cost of each to various destinations.

B.E.A. have produced further comparisons, some of which are shown, and which have been examined by Thomas Cook and Sons, who state that they are unable to break down the fares shown for the shortest surface transport.

In calculating the cost of the shortest surface transport no allowance has been made for the price of meals while en route, or for the price that would have to be paid for first-class sleeper reservations, which would bring the standard of comfort of the surface transport into line with that provided on the air services. The price, for example, of a first-class sleeper for the single journey to Marseilles is £5 6s 9d; to Rome, £12; and to Lisbon, £9 10s 3d.

If a sum is added to the cost of the surface transport to allow for the price of the first-class sleeper, for the higher price of meals on trains and boats compared with those provided in B.E.A. aircraft, and for the money spent on tips to porters at frontier stations, wagon-lit attendants, and so on, with the exception of journeys to Istanbul, Ankara, and Gibraltar, the total cost by B.E.A. is either approximately the same as, or less than, the cost of shortest first-class transport. After the addition of the cost of a first-class sleeper, the fare to Marseilles by B.E.A. is £2 7s 4d cheaper than by boat and train for the single journey, to Lisbon £1 7s 7d cheaper, and to Rome £2 5s 2d cheaper.

The table shows the fares paid and time taken on some routes: (a) by air with B.E.A. and (b) by shortest first-class surface transport.

Destination		Single Journey	Return Journey	Time taken	Time saved by B.E.A.	Amount by which B.E.A. fare exceeds surface fare	
		£ s d	£ s d	Hr Min	Hr Min	Single £ s d	Return £ s d
Brussels	(a)	6 0 0	10 16 0	3 30	5 30	0 17 0	0 19 9
	(b)	5 3 0	9 16 3	9 0			
Copenhagen	(a)	19 8 0	34 18 0	5 30	27 30	6 1 10	9 2 8
	(b)	13 6 2	25 15 4	33 0			
Lisbon	(a)	26 0 0	46 16 0	9 10	59 50	8 2 8	11 1 4
	(b)	17 17 4	35 14 8	69 0			
Oslo	(a)	21 0 0	37 16 0	8 0	39 0	B.E.A. £1 12 10 cheaper	B.E.A. £6 3 7 cheaper
	(b)	22 12 10	43 19 7	47 0			
Prague	(a)	18 0 0	32 8 0	6 0	42 0	B.E.A. £1 1 6 cheaper	B.E.A. £4 16 6 cheaper
	(b)	19 1 6	37 4 6	48 0			
Ankara	(a)	57 0 0	102 12 0	30 30	58 30	24 17 8	38 7 4
	(b)	32 2 4	64 4 8	88 0			
Athens	(a)	41 10 0	74 14 0	13 20	— —	B.E.A. £15 9 6 cheaper	B.E.A. £39 5 0 cheaper
	(b)	56 19 6	113 19 0	(not given)			

REMOTE INTERNAL SERVICES

WHEN asked in the House recently on the possibility of restoring inter-island air services in the Orkneys, and to the west country, Mr. Lindgren replied that the island services were operated before the war with aircraft which were now obsolete. The provision of airfields suitable for new types would involve considerable expense and time, he said, and the Minister was examining alternative methods of serving the islands by air.

With regard to the west country, Mr. Lindgren said that an announcement about services could not be made until a review had been completed and that it would be at variance with the Act to allow charter companies to run scheduled services where the Corporations were unable to do so.

VIKING TOUR CONCLUDED

SINCE taking off from Hurn on April 13th for a demonstration tour, the Vickers Viking G-AJJM has flown 200 hours covering 40,000 miles in transit to Australia and New Zealand and in demonstration flights. The tour was concluded on June 15th, when the aircraft landed back at Wisley.

The longest single-stage transit flight was 1,350 miles from Sydney to Auckland and the greatest distance flown in transit in one day was during the return journey from Bombay to Cairo, 2,870 miles in 14 hours 55 minutes flying time, making stops at Jiwani and Basra.

Demonstration flights were given in all the principal towns in New Zealand and Australia during which more than 1,,000 persons were flown, amongst them being Mr. Peter Fraser, Prime Minister of New Zealand, who flew from Wellington to Auckland.

Transit mileage totalled more than twenty-nine thousand

Civil Aviation News . . . . .

miles in 150 flying hours. Fifty hours were flown on demonstrations.

TWO B.O.A.C. PILOTS RETIRE

CAPT. G. W. BELLIN and Capt. K. M. Cass, two of the British Overseas Airways Corporation's most experienced pilots, have retired

Capt. Bellin, a South African by birth, has flown 18,800 hours —in which time his air mileage totals 2¼ millions, a total believed to have been exceeded by only one other civil air pilot, Capt. E. S. J. Alcock, also of B.O.A.C.

In 1927 he became an instructor at the Johannesburg Light Aeroplane Club and in 1929 joined Union Airways which was later taken over by South African Airways. He joined Imperial Airways in 1935 and two years later was promoted to command an Empire flying-boat which class of aircraft he has commanded ever since, flying mainly between Durban, Egypt and India. Capt. Bellin's war service included the evacuation of Crete and of members of B.O.A.C. staff from the Andaman Islands in the Bay of Bengal. He now intends to farm at Greytown, Natal.

Capt. Cass, after service with the R.A.F., also joined Imperial Airways in 1935. He obtained his captaincy a year later and spent the greatest part of his service commanding Empire flying-boats out of Durban, South Africa, where he made his home. He has flown more than 13,000 hours.

Capt. G. W. Bellin

Capt. K. M. Cass

A.O.A. FINLAND SERVICE

THE first regular service between America and Finland was started on June 26th by American Overseas Airlines. The service is, in effect, an extension of the company's route from America to the Scandinavian capitals. Owing to runway limitations at Malmi, Helsinki, passengers for Finland change at Bromma, Stockholm, from the trans-Atlantic Skymasters to Dakotas. There are no night landing facilities at Malmi, and passengers remain overnight at Stockholm, flying on to Helsinki the following morning. These flights will be made three times a week in each direction.

FUTURE OF AUSTRALIAN ROUTE

MR. HUDSON FYSH, managing director of Qantas Empire Airways, the Australian airline which is now entirely government owned, was in this country from June 1st to 17th to discuss future plans for operating the route to Australia from the U.K.

It will be remembered that Q.E.A. have purchased four Constellations which, with a payload of 13,500lb, including 42 passengers, and capable of flying stages up to 2,500 miles, makes the existing arrangement of joint services between B.O.A.C. and Q.E.A. quite impossible.

Mr. Fysh has explained the arrangements, which should take effect from about the beginning of 1948.

"It is expected," he said, "that two services a week in each direction between Sydney and London will be operated by Qantas while B.O.A.C. will operate one Lancastrian carrying mail and freight only, and two flying-boat passenger services, with Solents. Though the flying-boats will be considerably slower than the Constellations, they will serve a greater number of centres and will be supplementary to the service with American aircraft.' When viewed as a whole, it would seem that such an arrangement would provide a good air service to travellers all along the route. B.O.A.C. have not, however, confirmed that these decisions are final.

The introduction of the Constellation to the England-Australia route to meet competition is considered essential by Australia, and necessary to help preserve British traffic on the main trunk route of the Empire. It seemed, said Mr. Fysh, to be that in the future competitive fares on international air routes would be fixed on the basis of the most economic operator, and it was felt, in consequence, that events in the next five years would strongly bear out the wisdom of the course pursued.

In addition, Australia had to think of her own requirements in a general way in regard to the establishment of such facilities within her own boundaries and when reviewing her standing and geographical position. In this respect the Constellations would be wholly maintained in Australia and would intro-

ACTIVITY AT BLACKBUSHE : Passengers about to embark on one of the Airwork Vikings flying to Paris and Dinard for the Polytechnic Touring Association. On Friday, June 20th, the twenty-sixth tour left Blackbushe, and on the same day the twenty-second flight to Wadi Halfa took off, and a third Viking left for Dar-es-Salaam.

duce for the first time to that country the new operating technique which was the technique of the immediate future and which would create a reserve of trained crews, ground engineers and technicians of value and necessity to that country.

"The plain fact was," he said, "that no modern power could afford to be without such a type of aircraft for long and keep its position in international air transport and cater for defence needs at the same time." Long-range aircraft flying at altitude and speed would form a factor of vital importance in the future. Australian interests felt that their part in maintaining Empire air communications with the aircraft which they had chosen would be a very considerable and vital one. Meanwhile the British aircraft manufacturing industry must produce the type of aircraft required in the future to hold British international air traffic or go completely to the wall in this type of aircraft production.

Mr. Fysh concluded his comment by saying that "as a good friend of the British aircraft industry for many years, I would say it can only be done by a fearless facing of the facts and a free hand in the right direction, because the main thing that matters is results."

AIR TRANSPORT ADVISORY COUNCIL

THE Order in Council setting up the Air Transport Advisory Council in accordance with Section 36 of the Civil Aviation Act, 1946, has now been made. The Council will consider any representation made to them by the public concerning the adequacy of the facilities provided by any of the three statutory Airways Corporations, or the charges made for such facilities, and to consider questions referred to them by the Minister of Civil Aviation. The Council will not have the executive powers of a tribunal but will report their conclusions and make recommendations to the Minister of Civil Aviation, who will decide what action shall be taken.

DEBUT: Mr. Aubrey Corbin demonstrated the Concordia at the Air Command Display at Lee-on-Solent on Wednesday of last week. The Cunliffe-Owen twin is seen flying over a Firebrand.

The Lord Chancellor has appointed Lord Terrington to be Chairman of the Council, and the Minister of Civil Aviation has appointed Colonel Sir Donald Banks, Mr. John Ure Primrose, A. Cdre. the Hon. W. L. Runciman, and Mr. G. S. Szlumper, to be members. The offices of the Council are at King's House, 10, Haymarket, S.W.1, and all communications regarding matters which the Council are empowered to consider should be sent to the Secretary of the Council at that address.

Lord Terrington was Principal Assistant Secretary of the Ministry of Labour and National Service from 1941 to 1944. Since then he has been a member of the National Arbitration Tribunal, of which he is now Chairman. Colonel Sir Donald Banks was the first Director-General of the Post Office and the first Permanent Under-Secretary of State for Air. After serving as Deputy Adjutant-General at G.H.Q., B.E.F., in 1940, he was appointed Director-General of Petroleum Warfare. Mr. John Ure Primrose is Lord Provost of Perth.

A. Cdre. Runciman was Director-General of British Overseas Airways Corporation from 1940 to 1943 and subsequently Air Attaché at Teheran. Mr. Szlumper was General Manager of the Southern Railway immediately prior to World War II in which he served as Director-General of Transportation and Movements at the War Office, Railway Control Officer at the Ministry of Transport and Director-General of Supply Services at the Ministry of Supply.

The nominations of A. Cdre. Runciman and Mr. Szlumper respectively cover air and surface transport.

BREVITIES

A new passenger service between Prague and Budapest commenced on June 16th with Dakota aircraft by Czechoslovak Airlines, in conjunction with the Hungarian line Maszovlet. At present the service runs twice a week, but four services a week are to be operated from July 15th.

* * *

Civil airline routes in New Zealand are to be covered by a chain of M.F. radio ranges. Omnidirectional equipment will eventually be installed.

* * *

Air France started the service from Edinburgh to Le Bourget on June 23rd. This is the first direct service from Edinburgh to the Continent and will be run three times a week until better facilities are available at Turnhouse.

FROM THE CLUBS

The Wolverhampton branch of the R.A.F. Flying Club is pushing ahead quietly after a slow start in November, 1946. The extraordinarily bad weather experienced until March held up any flying activities, but both membership and flying are now on the increase. F/L. Loveridge is in charge of flying at the airfield and two machines are available to club members, a Moth Minor and an Auster.

* * *

During the month of May a total of 341 hours was flown at the University and Cambridge Flying Clubs at Marshall's Flying School, Cambridge. 18 hours 41 minutes night flying was carried out in preparation for "B" licence tests, and good weather throughout the month allowed a considerable increase to be made in aero-towing by the Cambridge University gliding club.

* * *

Flying clubs everywhere will sympathize with the losses incurred by the Herts and Essex Aero Club when fire broke out in two hangars on the night of June 22-23. Both hangars, three Proctors and eight Tigers were destroyed in the blaze. Aroused at 12.30 a.m., members of the club managed to save three club Tigers and one Danish KZ-3, belonging to Morian Hansen, who was on a flying visit to this country. Mr. F. Darlow, secretary of the club, informs us that although flying will naturally be curtailed, the club will continue its activities with the three remaining Tiger Moths.

* * *

Visitors to the Northampton Aero Club at Sywell airfield are always welcome and will find a modern clubhouse where meals may be obtained. The club was re-opened on the 1st of February this year and, after a rather bad start during severe weather, the club is again active with well over 100 members of which 40 to 50 are flying members. Seven members own their own aircraft and several pupils are on the point of obtaining their "A" licences.

* * *

Membership of the Fair Oaks Aero Club continues to increase and is now approaching three hundred. A fleet of two Magisters, three Tigers, one Auster and a Proctor V is available for club flying and the flying hours logged from January to May numbered 470. Social amenities of the club include a comfortable club house and tennis courts. The dance held on the last Saturday of each month is proving an ever-increasing success.

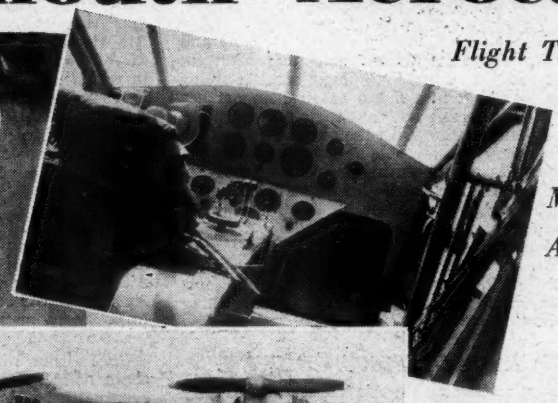
* * *

Over twenty members of the Edinburgh Flying Club have gained their "A" licences since the club restarted last year, and six of these since the winter snow disappeared. A few members have also obtained their "B" licences. Cross-country flying is popular with members and they look forward to more clubs opening up in the North so that they may widen the scope of their social calls. At present the Strathtay Aero Club is first favourite and Edinburgh club Austers may frequently be seen at Scone.

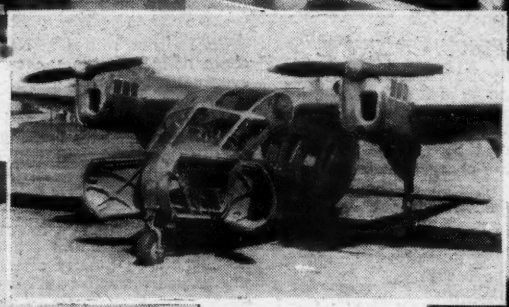
Portsmouth Aerocar

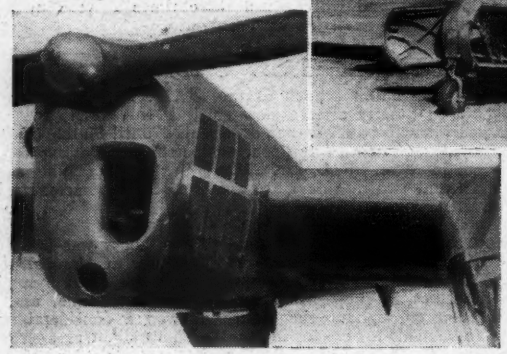
Flight Trials about to Commence: Production Model to be All Metal

(Top left) The front-hinged car-type doors are of generous area and afford excellent accessibility to the cabin.



(Top right) Single control only is fitted to the prototype although dual equipment will be standard on production aircraft.

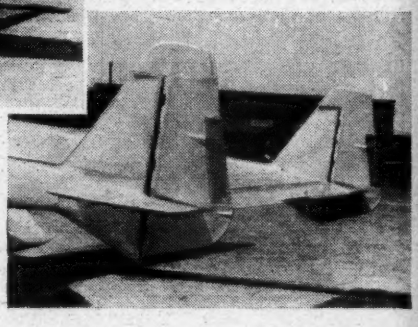




(Centre) Flush-fitting nose doors render the controls very accessible.

(Left) Cooling-air outlet is by gauze valence panels.

(Right) Elevator and rudders are each mass balanced.



AS notified in the June 26th issue of *Flight*, the Portsmouth Aerocar Major interim prototype had its maiden flight on Wednesday, June 18th. In point of fact, the aircraft was wheeled out of its hangar shortly after 4 p.m., and Major F. L. Luxmoore, Joint Managing Director of Portsmouth Aviation, Ltd., who was responsible for the design concept of the machine, was so satisfied and confident with the way everything felt that after doing a few taxying trials he took the aircraft off for its first flight at approximately 7 p.m. So short an exploratory period prior to first flight is very likely something of a modern record. The Aerocar has not put in very much time in the air as yet, but the flight trials proper are due to start shortly in the hands of Mr. Alan Jones, the company's test pilot. However, in the short amount of flying that has been done, the prototype has behaved well and comes fully up to all that was expected of it.

Change to Metal

A tremendous amount of interest has been shown in the Aerocar by concerns all over the world, and the company state that they have received orders to the value of £2,000,000. In view of this, and in the light of Britain's uncomfortable financial position, it is greatly to be hoped that production of the all-metal Aerocar will be inaugurated at the very earliest opportunity. The present prototype is of composite construction employing fabric-covered wooden wings, booms and tail surfaces, in conjunction with a metal gondola fuselage. The decision to cancel this structural design in favour of an all-metal structure is undoubtedly a wise one, more particularly in that it renders the aircraft suitable for use in tropic climates. Nevertheless, the prototype is of considerable value in that it does demonstrate the aircraft's flying capabilities and, as it were, "proves" the design as such. It should also be of real use in showing up any possible shortcomings at an early stage so that, if met, these can be overcome without delaying the metal production aircraft.

S.B.A.C. APPOINTMENTS

MR. W. R. VERDON SMITH, Director of the Bristol Aeroplane Company, Ltd., Rotol, Ltd., and A.F.N., Ltd., has been re-elected President of the Society of British Aircraft Constructors for the year 1947-48. Sir Roy H. Dobson, C.B.E., F.R.Ae.S., Managing Director of A. V. Roe, Ltd., director of the Hawker Siddeley Aircraft Co., Ltd., and chairman of Aircraft Hydraulic Appliances, Ltd., has been elected Vice-President and Mr. Arthur Gouge, vice-chairman of Saunders-Roe, Ltd., remains Deputy President.

In addition to the above appointments, the following have been elected to the Management Commitee of the S.B.A.C.:—Robert Blackburn, O.B.E.; H. Burroughes; H. P. Folland, M.B.E.; W. T. Gill; Sir Hew Ross Kilner, M.C.; F. G. Miles; Sir Frederick Handley Page, C.B.E.; F. E. N. St. Barbe; Sir Frank Spencer Spriggs; Walter Hackett, Jnr. (Group A Associate members, S.B.A.C.); E. J. Earnshaw (Group B Associate Members, S.B.A.C.).

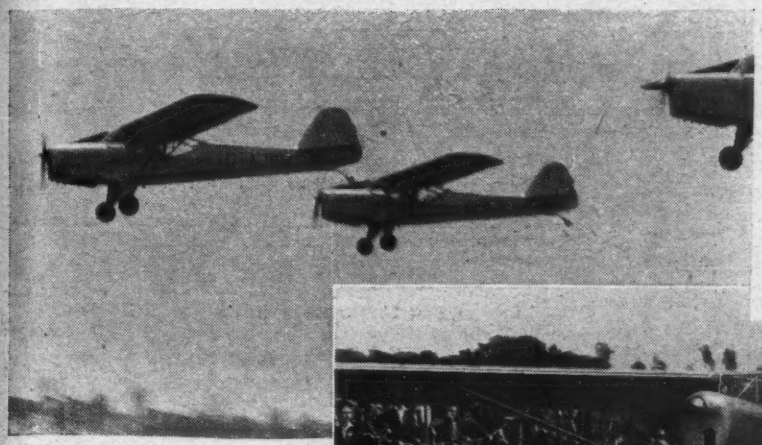
JOINING DOWTYS

CAPTAIN HUBERT S. BROAD, M.B.E., A.F.C., has recently been appointed to the staff of Dowty Equipment, Ltd., the well-known hydraulics specialists, as outside representative to effect liaison with airline operators and R.A.F. Stations. As will be recollected from Hubert Broad's potted biography in our "British Test Pilots" series (*Flight*, March 28th, 1946), he was chief test pilot to de Havillands for fourteen years, chief production test pilot to Hawkers for some years during the war, and during his career has performed the initial flight trials of no less than thirty-six prototypes.

AUSTER RALLY

A Variety of Events at Rearsby Meeting

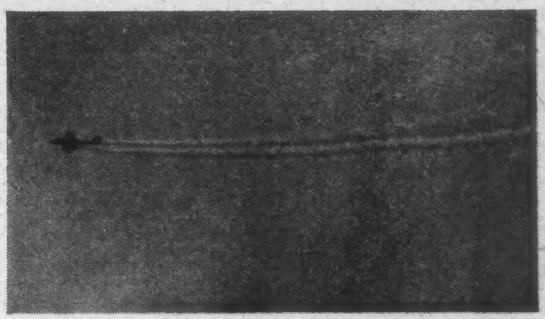
"Flight" Photographs



(Above) LOCAL INHABITANTS: The formation flying by three ex-R.A.F. members of Auster Aircraft Ltd. (Right) Lord Nathan taxies in after a flight in an Auster.

GOOD weather and a fair crowd marked the Auster Flying Club's rally at Rearsby airfield on Sunday last. There was plenty of good flying to be seen, but from the ordinary spectators' point of view, it was difficult to follow the sequence of events. The official programme on sale bore little or no resemblance to that which actually took place. Joy-riding, which was run concurrently with most of the events, added to the confusion, and a paucity of whispering loudspeakers did little to help that part of the crowd on the windward side of the control tower.

After being introduced by Mr. P. Wykes, Lord Nathan, Minister for Civil Aviation, opened the rally, and while he was speaking, began the first event, a formation flight by three Austers piloted by Messrs. Pendleton, Millar and Selby. The formation was excellent. A Transport Command Dakota in bright silver took the sky next until Mr. Snarey, A.F.C., chief test pilot of Austers, followed with an exhibition of an Auster VI. C. F. French demonstrated the twin-engined Reid and Sigrist trainer with his usual skill—he makes the aircraft appear to be much higher-powered than it really is.



J. F. Fifield doing his sky-writing act with a Gloster Meteor III

Part of the crowd and one of the aircraft parks at Rearsby airfield on Sunday last.

The three Magisters from the Fairey Aviation Flying Club put up a remarkable show of formation aerobatics, but in a loop one of the wing men fell away badly.

Outstanding in every respect was the demonstration of a Meteor III from the National Gas Turbine Establishment by F/L. Fifield, D.F.C., A.F.C. In a series of beautifully executed manœuvres, he contrived to belch unburnt paraffin vapour from the Derwent jets and the whole show savoured of sky-writing. It is questionable, however, whether the picnickers in the enclosures really appreciated the generous admixture of paraffin mist in their cakes.

Other good events were the demonstrations of a Miles Gemini, a Percival Gull and an Avro York. The latter was in the capable hands of Mr. Field-Richards, who long ago learnt the art of putting on a show in just the right part of the sky for the crowd to see it easily.

CORRESPONDENCE

The Editor does not hold himself responsible for the views expressed by correspondents. The names and addresses of the writers, not necessarily for publication, must in all cases accompany letters.

SURPLUS LIGHT AIRCRAFT

Where Have All the Austers Gone ?

TO my letter "Surplus Light Aircraft" in your issue of May 29, a note was added saying there were no surplus aircraft. I may be wrong, and if I am I hope you will excuse me, but while talking with R.A.F. personnel at Kastrup airport I was told that you had quite a large stock of Austers which were used during the war as communication aircraft. Where are they now? And R.A.F. officers still use the German gliders once based here. They use them for fun; we need them for training. J. C. C. ELHOLM.

Copenhagen.

POWER FOR BOMBERS

Piston Engines for Another Ten Years

YOUR editorial in the June 19th issue of *Flight* raises a matter that, one fears, is not being given all the considerations in this country that it deserves.

I refer to the continued development of the high-output piston engine.

This country is at a distinct disadvantage—and so is the aircraft designer—due to the lack of aero engines in the same category as the Pratt and Whitney Wasp Major—that is in the 3,000-3,500 h.p. class.

Admittedly we must push on with increasing vigour with the design and construction of the jet engine, both with and without airscrew, but do not let us do this at the expense of the piston engine. Be it for military or civil purposes, the piston engine has another ten years at least of useful life, and may be more.

What we need, above all, in our civil aircraft is reliability, long life and economy in operation, and this can, to my mind, be achieved far more easily and quickly with the piston engine than with any other form of power plant.

In due time and after long and patient research, development and test, the jet engine will, undoubtedly, come into its own, but during that time we must see far greater efforts than are now apparent put into the improvement of the large piston engine in this country, so that power for power and weight for weight we are, at any rate, on an equal footing with our friends in America. "INTERESTED."

CASTERING UNDERCARRIAGES

Blèriot Did Have Coiled Tension Springs

ALLOW me to contradict the editorial comment in respect of the undercarriage of Blèriot monoplanes.

As my firm (Dart Aircraft, Ltd.) constructed the Blèriot XI monoplane to which Mr R. G. J. Nash refers (as an exact flying replica of the aircraft with which M. Louis Blèriot crossed the Channel in July, 1909) I am in a position to assure you that he is perfectly right when stating that the wheels were centred by coiled tension springs housed inside the tubular vertical struts. The spring inside the starboard strut centres the port wheel and vice versa.

Later modifications of the Blèriot XI type (of about 1912) as, for instance, the type on which Pégoud demonstrated, had the centring effected by little "bunjies" in a lower cross bracing of the undercarriage. The Blèriot XXVIII type "Regulaire" with three-cylinder Anzani Y engine and its clumsy double skid at the tail had, however, the coiled springs in the same arrangement as the Blèriot XI prototype (though the undercarriage design is widely different).

A. R. WEYL.

A Reader Investigates Blèriot History

AS it so happens, I am at present carrying out some research among old records with a view to building an engine-driven 2in scale model Blèriot XI of the cross-Channel type and so, of course, the details of the undercarriage have received full attention. I have checked up in Vol. 1 of *Flight* and *The Aero* and have paid a visit to the Science Museum. What a wealth of interest and memories that holds—to study a J.A.P. version of the XI, and without exception the only method of self-centring was by a combination of "bunjie" and steel wire. No evidence can be found of any form of internal coil spring. No mention is made of such in any reports of Blèriot's experiments dating from late 1908 until well after he had flown the Channel.

The XI underwent considerable modification during its testing prior to its successful Channel "flip," but a study of all pictures published shows that the undercart literally "stayed put."

By the way, what about a short weekly historical feature for the benefit of our younger brethren?

C. A. RIPPON

(Reader of *Flight* since No. 1).

RE-EQUIPPING BOMBER COMMAND

Technical Requirements Branch Not Complacent

MAY I respectfully rebuke your correspondent, Mr. T. I. Marker, for his letter on the re-equipping of Bomber Command, which appeared in your issue of June 12?

Mr. Marker, with the typical British attitude, belittles our own efforts and lauds that of the Americans. In the first place there seems no justification in criticizing the complacency of the Technical Requirements Branch, who are now passing through the most transitory period of military aircraft. Even the instance quoted by your correspondent, referring to the Meteor IV not being cleared to carry bombs, is incorrect. Tests and trials which proved perfectly satisfactory were carried out on this aircraft over a year ago.

E. S. GREENWOOD.

SPEED RECORD

Comparison with Meteor's Effort

AFTER many months of effort, the Americans have succeeded in capturing the world's speed record. That is a creditable achievement, but not one to cause surprise, when one considers the amount of money spent in developing the Lockheed Shooting Star and its G.E.C. gas turbine. It seems a pity therefore that the announcement of the new record in this country should be accompanied by conflicting explanations which must tend to bewilder the man in the street.

The B.B.C. stated that if the Meteor had been flying at Muroc, it would have achieved 640 m.p.h., whilst an expert quoted by the Press put the figure at 630 m.p.h. Those with a technical understanding of the problem are well able to appreciate why conditions at Muroc, with its 12-mile run and air temperature of about 100 deg F, are more favourable than a normal Service airfield on the south coast and an air temperature of about 50 deg. F. For them, the most necessary facts are the air temperature and Mach number of the British record and the air temperature and Mach number of the American one. It would then not be difficult to work out exactly how many m.p.h. in California the Tangmere Mach number of the Meteor would have been worth.

On the other hand, for the non-technical listener or reader, would it not be better to say that the Lockheed flew under such favourable conditions that the Meteor would have beaten it had they been flying in the same place simultaneously?

JOHN GRIERSON.

FORTHCOMING EVENTS.

uly 2nd to 23rd.—Air League of British Empire: Blackpool (Squires Gate) Flying displays with R.A.F. support on 9th, 16th and 23rd.

July 3rd to 13th.—Soaring Contest for Swedish National Championship, Orebro, Sweden.

July 4th to 20th.—Brussels International Aero Show.

July 6th.—Gloucester Flying Club: At Home and flying display. Staverton airfield.

July 12th to 14th.—Deauville International Air Rally.

July 13th.—Royal Aero Club of Belgium: International flying meeting at Liege.

July 19th to 21st.—International Air Rally at Knocke Le Zoute.

July 20th.—Prague: International air display.

July 20th.—Northern Heights Model Flying Club: Gala day at Langley airfield, Bucks.

July 26th and 27th.—United Services Flying Club: Air display and air rally. Elstree airfield, Herts.

July 30th to August 9th.—Aero Club of Switzerland: International gliding contest. Samaden in the Engadine.

Aug. 1st.—Start of Belgian "Aerial Fortnight," Le Zoute.

Aug. 2nd and 3rd.—Aero Club de Versailles: Toussus le Noble air rally.

Aug. 2nd to 4th.—Royal Aero Club of Belgium International air rally: Le Zoute.

August 9th and 10th.—Southend flying meeting.

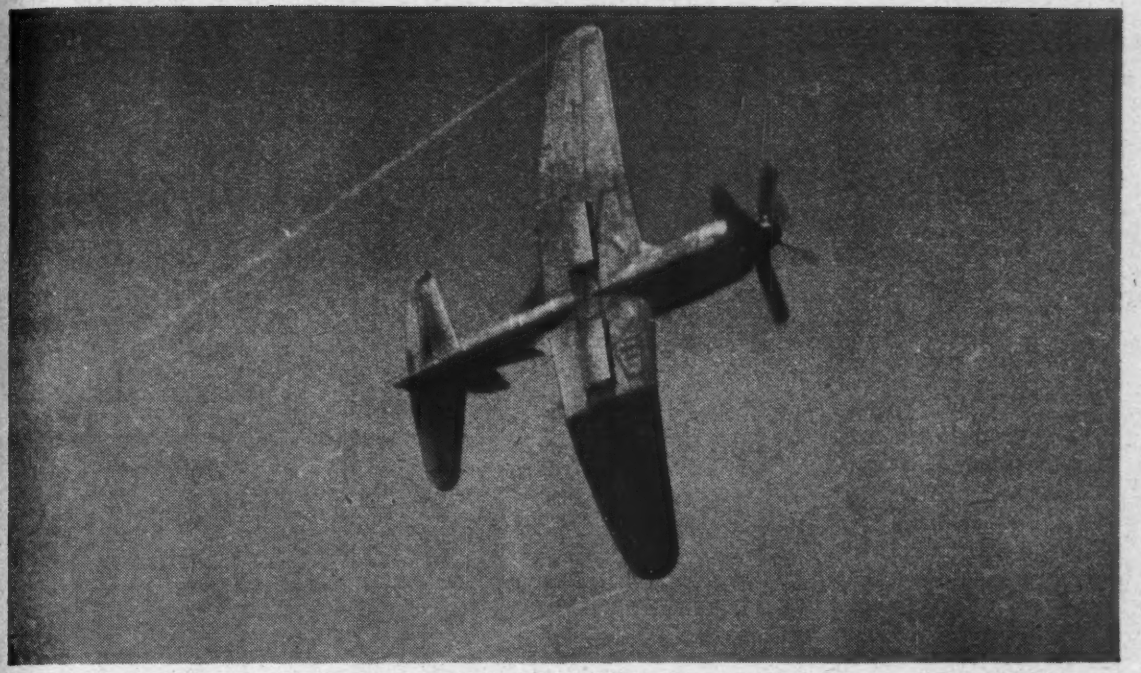
Aug. 15th to 18th.—Strathtay Aero Club: Perth air display.

August 30th and 31st.—Cinque Ports Flying Club: Flying meeting at Lympne airport.

Sept. 3rd to 6th.—Royal Aeronautical Society: Aeronautical Congress.

Sept. 6th.—Naval Aviation: Air display and static exhibition. Lossiemouth air station, Moray, Scotland.

Sept. 9th to 12th.—S.B.A.C. Exhibition and Display.



WEAVING WYVERN: Mr. Harald Penrose during his dashing display of the new Westland Wyvern T.F.1 strike-fighter at Lee-on-Solent last week. The under-wing radiators are well shown.

SERVICE AVIATION

W.A.A.F. Birthday Celebrations

AT the eighth birthday celebrations of the Women's Auxiliary Air Force at R.A.F. Fighter Command, Headquarters, Bentley Priory, Stanmore, Middlesex, last Saturday, Air Chief Commandant Her Royal Highness the Duchess of Gloucester was present. She was received by the W.A.A.F. Director, Air Commandant F. H. Hanbury, M.B.E., and over three hundred W.A.A.F. officers and airwomen.

A luncheon party in honour of the Duchess of Gloucester was given by the Air Officer Commanding-in-Chief, Fighter Command, Air Marshal Sir James M. Robb, and Lady Robb, after which a number of W.A.A.F. officers and airwomen were presented to Her Royal Highness.

Displays were given by a W.A.A.F. physical fitness team and by the W.A.A.F. Central Voluntary Band. Another attraction was a preview of the designs for the new W.A.A.F. uniform, which it is hoped to introduce when the supply position of clothing allows. During tea, the W.A.A.F. birthday cake was cut by Her Royal Highness.

Auxiliaries in Camp

NO. 600 (CITY OF LONDON) SQUADRON from Biggin Hill, and 609 (West Riding) Squadron from Yeadon, have been the first two auxiliary squadrons to hold their annual camp since the war. This was at Tangmere, between June 14th and June 28th. Glorious weather and the co-operation of the Tangmere station personnel made it an outstanding success and both units are anxious to return again next year.

No. 600 Squadron, under the command of S/L. Norman Hayes, D.F.C., is now equipped with the latest Spitfires, whilst 609 Squadron, commanded by S/L. P. A. Womersley, D.F.C., have changed their wartime role of day fighters and train busters, and have become a night fighter squadron armed with Mosquitoes. Training is now in full swing, and both squadrons have soloed several pilots who have not previously had experience on the present equipment.

Both squadrons have had many applications from aircrew, especially pilots, but there are still many vacancies for ground crew of every category, and 609 Squadron are very short of navigators (radar). Limitations in training are not due so much to shortage of equipment, but to a deficiency of maintenance personnel.

The weekend invitation issued jointly by the two squadrons to all other A.A.F. units to fly down and visit them, proved most successful and Flying Control were overwhelmed with Mosquitoes and Spitfires from all parts of the country.

Royal Air Force and Naval Aviation News and Announcements

Sir John Slessor at Haileybury

AT the School Speech Day at Haileybury on June 27th, Air Chief Marshal Sir John C. Slessor, K.C.B., D.S.O., M.C., Air Council Member for Personnel, said: "I think it is especially appropriate that I shall speak mainly about the Services because to-day is the first Speech Day since an event which will affect all your lives in the near future—I mean the decision of His Majesty's Government to introduce permanent compulsory National Service in peacetime. As a matter of fact there is nothing really very new for the Public School boy in the thought that on leaving he will have to go into one of the Services. For 12 out of the last 33 years boys have had to accustom themselves to the idea of military service on leaving—in 10 of those years it was for an indefinite period and with the virtual certainty that they would actually have to fight and maybe give their lives for their country. That possibility has never deterred any man from this school. On the contrary, the fact that we were at war provided the great incentive; the cause for which no one worth considering has ever hesitated to make any sacrifice; as so tragically many old boys of this school have proved. To-day that great incentive is missing. But in my opinion a greater incentive and a no less noble cause will be yours—the prevention of war."

Appointment

THE Air Ministry announces the appointment of A.V-M. Francis Joseph Fogarty, C.B., D.F.C., A.F.C., as Senior Air Staff Officer, Flying Training Command.

A.V-M. Fogarty has been Air Officer in Charge of Administration at the Headquarters of R.A.F. Mediterranean and Middle East Command since June, 1946, and was formerly Air Officer Command-

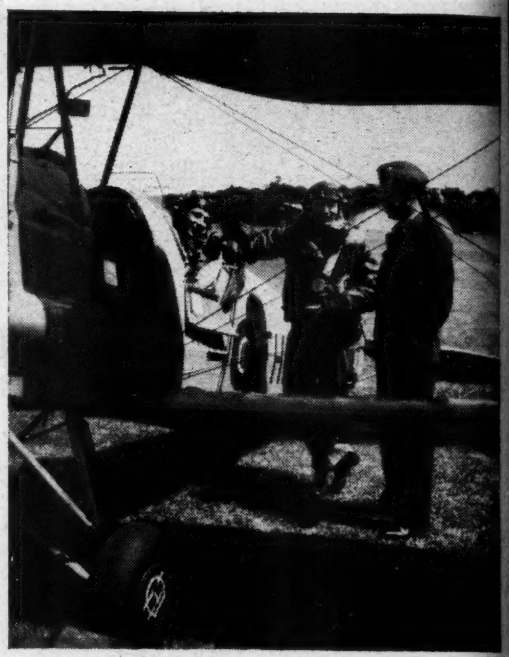
Service Aviation . . . . .

ing, Air Headquarters, Italy, from November, 1945. Previously he was Air Officer in charge of Administration, Mediterranean Allied Air Force, to which post he was appointed in March, 1945, after having been for seven months Senior Air Staff Officer of No. 4 Group, Bomber Command. From December, 1942, until July, 1944, he was in Canada as the liaison officer for training with the United Kingdom Air Liaison Mission. Before going to Canada he was A.O.C. No. 8 Group, of which he had previously been Senior Air Staff Officer, and in 1940-41 he commanded R.A.F. Station, Mildenhall.

A.V-M. Fogarty was born at Folkestone in January, 1899, and was commissioned in the R.A.F. in 1918 after having served for a year in the R.F.C.

100,000ft by Met. Balloon

LAUNCHED from the meteorological station at Larkhill, Wilts, an Air Ministry meteorological balloon lately reached a height of 100,000ft. It was recovered at Dorking. At a height of 84,000ft the balloon passed out of radar range, and its geographical position was unobserved during the remainder of its flight, though there is no doubt that it reached the height claimed. In the past it has been exceptional to reach heights of more than 60,000 to 70,000ft, though recently balloons have attained 70,000 to 90,000ft. Regular ascents to 100,000ft may eventually result from recent improvements in balloon material. It is explained that the problem is two-fold; first, the balloons must be strong enough to stand the stretch imposed at these immense heights and the very low temperatures, and secondly, instruments must be evolved for measuring pressure and temperature in a region where the pressure is only about 1/60 of that at sea level. The 7ft balloon which attained 100,000ft swelled to 20ft.



FIRST AT PANSHANGER: Thirteen R.A.F.V.R. Flying Schools and Reserve Centres are now operating in all parts of Great Britain. Our photograph was taken before the first flight at the Panshanger V.R. School, near Hatfield. In the cockpit of the Tiger Moth is Pilot II D. M. Stoneham. Mr. V. R. Moon, A.F.C., the chief flying instructor, is in the centre, and on the right is W/C. P. G. D. Farr, D.F.C. the Commandant.

Airborne Homing

OVER Japan recently an R.A.F. Dakota found and "homed" six R.A.A.F. Mustangs threatened with disaster by bad weather. The Mustangs had taken off from Iwakuni in fair weather for Bofu when a severe storm broke over both airfields. Their radio could not be heard but ground stations could be received; thus, it was impossible to help. As darkness approached the Dakota, flown by F/L. W. G. Drinkell, D.F.C., was about to land at Iwakuni when he heard the Mustang pilots requesting bearings. He climbed to 6,000ft above rain and cloud, re-transmitted bearings for the Mustangs and instructed them to rendezvous with him. Three were successful and were safely escorted to Miho. The Dakota then flew back in darkness, and, with the aid of ground bearings and Very lights, managed to rendezvous over Hiroshima with two of the Mustangs, while the third was in sight about five miles off. Cloud had now closed over Miho, and the "Dak" descended on instruments, with the two Mustangs in close formation. Within a few minutes the last Mustang had made a safe instrument landing.

RESTFUL INTERLUDE: Taking tea at Fassberg during the Secretary of State's lightning tour of B.A.F.O. stations are, left to right, G/C. Williams, A.V-M. Paxton, Mr. Noel Baker, A. V-M. Maitland, W/C. Sinclair and W/C. Holmes. Mr. Noel Baker has signalled to B.A.F.O. expressing his warm gratitude for kindnesses shown to him during his tour.

Met. Magazine Revived

THE *Meteorological Magazine*, official journal of the Meteorological Office, which has been suspended since January, 1940, has re-appeared in a new and enlarged form. It is published by H.M. Stationery Office, and contains articles in non-technical language on a variety of topics, including the first accounts of recent important research. Future articles will cover radiolocation of thunderstorms, the new international organization for aviation, and descriptions of new instruments.

A.T.C. and R.A.F.

AN Air Ministry Order just published aims at securing closer working connection between the R.A.F. and the A.T.C. It sets out the responsibility of the Service towards the Corps, now administered by R.A.F. Reserve Command. In future, every R.A.F. station to which an A.T.C. Unit is linked must have an officer detailed as Pre-Entry Training Liaison Officer, responsible for arranging training programmes, visits, rations, etc., and for liaising with Reserve Command formations. The Order tells the R.A.F. that all stations must give the fullest possible support to the Corps because of its value to the Service, especially in regard to recruiting. This value is already recognized in several ways. In general the criterion is the holding of the proficiency certificate. Those possessing this are guaranteed membership of the R.A.F., provided they are fit and vacancies continue. Their primary training period on joining the Service is reduced, and they receive preferential treatment in their choice of trade.